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PROSPECTS FOR FUTURE GRAIN CROPS SURVEYED

Moscow PRAVDA in Russian 20 Aug 79 p 2

[Article by S. Medunov, first secretary of Krasnodarskiy Kray Party Committee: "Teach and Demand"]

[Text] This year weather conditions in the Kuban', as well as in certain other areas of the country, have been extremely unfavorable. There was no rain practically all summer. At another time the drought would have turned into crop failure and would have threatened disaster. But agricultural workers in Korenovskiy, Ust'-Labinskiy, Timashevskiy, and Krasnoarmeyskiy rayons have now harvested an average of over 40 quintals of grain from each hectare. Grain growers in the Adygeyskaya Autonomous Oblast and Dinskiy, Leningradskiy, Kurganinskiy, Bryakhovetskiy, Tbilisskiy, Primorsko-Akhtarskiy, and other rayons also achieved good results.

The success of the Kuban' farmers is the result above all of great organizational and educational work by party and public organizations and economic organs. The grain growers are persistently and purposefully striving to increase soil fertility, and they have raised the level of farming to an unprecedented level.

Yes, people are deciding everything. In the final analysis the fate of the plans and obligations depends on the correct selection and placement of cadres and their ability to mobilize labor collectives for a further rise in the economy and on personal responsibility for the sector entrusted to them. Work with cadres is the key question for any party committee. In this respect we are receiving inestimable aid from that very important document -- the decree of the CPSU Central Committee "On the Organizational and Political Work of the Krasnodarskiy Kray Party Committee in Carrying out the Decisions of the 25th CPSU Congress."

The teaching of advanced experience to cadres and the increasing of their personal responsibility for the final results of their labor are principles which form the basis on which the kray party organization is achieving a rise in production efficiency. In fact, before requiring a person to perform a specific job, it is desirable to analyze what real possibilities

exist for this and what the best practice teaches. This is why after proposing the next problem we strive above all to see that it becomes intelligible to all and that the most efficient ways of solving it have been made clear as well as possible. To achieve this we are organizing the mass training of party, Soviet, and economic leaders.

Thus, in beginning the extensive campaign to obtain strong and valuable wheats the kray committee organized a kray school on the base of the leading farms in Yeyskiy Rayon, or as we called it the "Yeyskaya Academy." All supervisory cadres underwent training -- from the secretaries of the kray party committee, chairman of the kray ispolkom and his deputies to leaders of towns, rayons, kolkhozes and sovkhozes, brigades, and divisions. A clear-cut and orderly technology for obtaining especially valuable grain was developed. They were asked concretely to introduce it and carry out the planned measures -- the level of responsibility of each leader was checked against his action.

And here is the result. In 3 years of the current five-year plan 7.1 million tons of strong and valuable wheat were sold to the state, and last year the sale of high quality grain exceeded 3 million tons. Deliveries of it increased over 10 fold.

We could continue to cite examples of what it means to teach and demand. How did we begin, let us say, the campaign for the complete eradication of weeds in the field? Establishing this matter as one of the most important tasks of the kray party organization and all kray workers, with the aid of scientists and specialists we developed a complex of organizational and technological measures. They were studied widely. Then the secretaries of rayon party committees, chairmen of rayon executive committees, and directors of kolkhozes, sovkhozes, enterprises, and institutions answered personally for their mandatory implementation.

No, everything was by no means done immediately. Years of strenuous work were required to expel weeds from the fields almost everywhere. According to estimates of specialists, this made it possible to obtain an additional 40 million rubles of product per year. But this is not just a matter of economic efficiency. This work helped in training cadres in the spirit of great responsibility for raising the level of farming.

Certain farm directors, citing the caprices of the weather, wrote off the crops on large areas, the dimensions of which sometimes reached 200,000 hectares. This simple practice gave rise to an irresponsible attitude toward the land, parasitical attitudes, and abuses.

We promoted the slogan: equality of sown and harvested areas: No write-offs, obtain a harvest from whatever area is sown. If the winter wheat becomes soaked or dies, resow it, restore the plantings at the expense of another grain crop. As a result the gap between the areas sown and harvested was reduced year by year, and last year we succeeded in achieving their complete correlation.

The campaign to conduct all the field operations within scientifically established periods proven in advanced practice posed a serious test for our cadres. The harvesting which was prolonged caused great losses of grain, the soil was not cultivated on time and the sowing was delayed, and as a result part of the winter crops froze and the yield was reduced.

The task facing us was formulated as follows: carry out the harvesting within 7 to 10 calendar days. This seemed unfeasible to many at first. But we were convinced of the feasibility of this established goal. Equipment supply to farms was reinforced, the skills of agricultural workers were improved, and party committees accumulated experience in conducting large-scale economic campaigns. Thus, the carrying out of this task was within their power. Only the organization of harvesting operations had to be approached in a new way.

Once again the studying of the experience of the best farms and the increasing of the responsibility of party and economic leaders for its assimilation helped. The example of leading farms convinced us that harvest preparations everywhere had to be begun in the very first days of the new year. Equipment repair had to be completed by the end of February or the beginning of March. Comprehensive plans for harvest operations for each rayon, kolkhoz, and sovkhoz had to be worked up and approved at party committee meetings by the middle of May. Any departure from this procedure has begun to be viewed as a type of extraordinary event. The demand is personal and particularly concrete. And now it can already be said that the carrying out of the harvesting in the shortest time is a common occurrence.

The movement to obtain the highest yields is developing more and more widely in the Kuban'. Hundreds and later even thousands of kray agricultural workers have followed the example of the initiators. They set the tone in carrying out all field work in the shortest time periods and on a high agro-technical level. This movement can be called a genuine school for teaching citizenship and patriotism and a state approach by field workers to meeting economic goals. In his letter of greeting to the Kuban' grain growers Comrade L. I. Brezhnev wrote that competition to obtain such high yields marks a qualitatively new stage in agricultural workers in carrying out the main assignment of the five-year plan -- increasing production efficiency.

The introduction into agricultural practice of a complex of measures to raise the level of farming made it possible to elevate significantly the results of labor. In the years of the five-year plan which have already elapsed the average annual grain harvest increased 1,224,000 tons, or 18 percent. Plans for the production and procurement of sugar beets, vegetables, tea leaves, and products of animal husbandry were exceeded.

True, it must not be said that all of our opportunities -- either in the village or in all agriculture branches -- are being used fully. Part of the farms have not mastered the production plan for grain, vegetables, and sugar beets, and 25 kolkhozes and 40 sovkhozes operated at a loss. The

growthrates of production volumes and labor production are low on a number of enterprises. The percent of unfinished construction still remains high, and many contract organizations are not meeting plans for construction and installation work. We are convinced that insufficient exactingness toward cadres on the part of certain party committees and primary party organizations is among the reasons for this.

Take the party organization of Glavkrasnodarpromstroy. On the surface everything here seems all right -- meetings and sessions of the bureau are held regularly and decisions are adopted designed to improve things. But if you look more deeply, it becomes clear that the main thing here is lacking in everything -- vital organizational work, a high degree of exactingness toward cadres, and an uncompromising attitude toward shortcomings. Communists were reconciled to many oversights; they were not concerned by the fact that directors of the main administration many times gave promises and assurances about the early starting up of projects and did not live up to them.

Of course, exactingness does not have anything in common with administration. The Kropotkin City Party Committee, for example, during the year imposed penalties on 35 economic and party directors, without discussions in the primary party organizations. In previous years all the division heads, four directors, three deputy directors, and nine chief specialists were replaced on the Arkhangel'skiy Sovkhoz in Tikhoretskiy Rayon. The rayon committee "shuffled" cadres, but matters did not improve on the farm.

The kray party committee corrected the comrades from the city and rayon party committees. It was explained to them that this is not the method for training cadres. Exactingness presupposes concrete business-like assistance, the training of cadres by effective work measures, and verification of execution.

But the other extreme is also dangerous. Former chairman of the Kolkhoz imeni XXII parts"yezda in Starominskiy Rayon, Tavluyev, set out on a path of exaggerations and deception, grossly violated financial disciplines, and abused his official position. But the rayon party committee limited itself to a severe reprimand and removed him from his position -- according to his own wishes. At the present time the rayon party committee's error has been corrected, and Tavluyev has been expelled from the party. Other persons who were engaged in exaggerating data and had dipped their hands in the state's pocket also had to be expelled from the party and removed from their positions.

The kray party organization and all Kuban' workers face great tasks. Prior to the end of the five-year plan it is necessary to almost double the average annual growth in production, perform a large volume of work on the renovation and technical retooling of enterprises, and put a number of major projects into operation. Output must be brought to 9.5 to 10 million tons of grain, 7 million tons of sugar beets, a million tons of vegetables, an equal amount of fruits, berries, and grapes, and 650,000 tons of meat. It is a matter of honor to keep our pledge given to the 25th party congress: to produce a million tons of Kuban' rice in 1980. Kray communists are exerting every effort to meet these goals.

COMMENTATOR DENIES PRIVATE PLOTS ARE MORE PRODUCTIVE THAN KOLKHOZES

Moscow NOVOYE VREM'YA in Russian No 38, 14 Sep 79 p 19 LD

[Observer Feliks Goryunov article under general heading "Conversation With a Reader"; first paragraph is reader's letter]

[Text] "I read recently in a newspaper that individual peasants in the Soviet Union provide one-third of all food products from their own land, which comprises only 3 percent of all cultivated areas. Does this not prove that a private plot is far more productive than a kolkhoz one?"-- Enrique Lopez, Manila, Philippines.

I, too, recently found similar information, Senor Lopez, in the London weekly THE ECONOMIST. Citing Soviet statistics, apparently for greater versimilitude, it reports that small plots in the Soviet Union provide one-fourth of the entire production of vegetables, two-thirds of potatoes and one-third of meat and milk. The coincidence of such "information" is no accident. You can sense here the hand of Sovietologists who regularly supply the Western press with various kinds of "facts" about the USSR.

Let us start with the fact that during collectivization, which began in the Soviet Union in the twenties, the peasants saw for themselves that it is far more sensible and profitable to work together than to run a family farm. This is why we no longer have any self-employed farmers. What, then, are we talking about? The private or, as we call them, subsidiary plots of kolkhoz members and sovkhoz workers and employees, as well as the garden and truck garden plots and dachas of city residents. Vegetables and fruit are chiefly grown on these plots. A section of rural residents keep livestock and poultry to provide the family with fresh milk, meat and eggs. The surplus is sold--either to the state at firm prices or in the kolkhoz market, where prices find their own level depending on supply and demand.

Subsidiary plots could not exist if, in addition to plots for gardens and truck gardens, state organs and kolkhozes did not allocate to kolkhoz members public pastures for livestock grazing, sell them livestock, feed and fertilizers at firm prices and provide them with favorable loans of money. Thus the development of public-sector farming does not run counter to but combines with the personal interest of peasants, who derive an additional income from their subsidiary plots.

If you compare the areas and output of subsidiary plots and public farms, as Sovietologists do, you must do so conscientiously for in the list of "all food products" they do not even mention grain crops, which occupy the greater part of all our cultivated land. And it is necessary to compare the areas sown to one and the same crops. Here the ratio is quite different. Potatoes and vegetable and melon crops occupy 5 million hectares on kolkhozes and sovkhozes and 4.2 million hectares on subsidiary plots. In other words, private plots take up 45 (!) percent of the entire area sown to those crops.

Now, Senor Lopez, let us investigate the question: Who provides more potatoes and vegetables? Here are the genuine, undistorted Soviet statistics. The subsidiary plots' share of total marketable produce is as follows: 13 percent of vegetables and 40 percent of potatoes.

The problem of subsidiary plots also cannot be understood without taking account of the fact that striking changes have occurred in the rural way of life. The peasant no longer has to break his back from dawn to dusk on his own patch of land to avoid starving. There is time left for leisure and, if so desired, for the subsidiary plot. It has become a real problem for us--not one invented by Sovietologists--that fewer peasants wish to keep their own livestock. And its share in total livestock numbers is also not small: 31 percent of cows, 21 percent of hogs, 17 percent of sheep and 77 percent of goats. Until recently the numbers of privately owned livestock were falling. From 1971 through 1977, for example, the number of private cows fell from 15.5 to 13.4 million and that of hogs from 16.6 to 11.8 million. Many rural families which used to supply their own meat and dairy products have now become consumers. This, incidentally, is one of the reasons for the shortage of meat, whose production lags behind the growing demand.

The meat surplus provided by kolkhoz members accounts for 12 percent of all marketable produce, and their milk surplus--5 percent. Although as you see yourself, this is far from the "one-third" calculated by THE ECONOMIST, these supplies are of considerable importance for providing the population with meat. This is why measures have been taken in recent years to increase numbers of livestock on private plots.

We do not hide our agrarian problems. But they cannot conceal the chief thing: the experience of the Soviet country's development has irrefutably proved the advantage of the public sector over the private sector. And if people endeavor to slander socialism's experience, it is because some people in the West fear that it will spread, particularly in developing states.

GRAIN HARVEST OPERATIONS IN VOLGOGRADSKAYA OBLAST

Moscow IZVESTIYA in Russian 15 Aug 79 p 1

[Article by A. Chemonin (Volgograd): "Each Ear Valued Highly"]

[Text] Oppressive heat reigns throughout the steppe region. Although it is no hindrance as far as the fields are concerned, nevertheless it makes matters difficult for the machine operators: the temperature is 35° in the shade, there is little air movement and it is difficult to breathe. Thus I addressed a question to combine operator M. Naumenko of the 8th Brigade at the Sovetskaya Rossiya Sovkhoz, which had stopped for a moment near where I was located: "How is it going, are you able to breathe?"

"Do not even bother to ask" he sighed, "at the moment I would like to sit down in a stream with the water reaching up to my chin."

"But they say that one is not able to cool off even in a stream at the present time" I stated, casting some doubt on the matter, "one only casts off steam, as in a bath."

"I don't know, since I have not tried it. It has rained for 3 days and now we must make up for lost time."

He climbs into his "captain's cabin," turns the steppe ship around and drives off in it. The combine moves along slowly in first speed. It is threshing 8-9 quintals per hectare, a rather good figure at the present time.

The director of the Sovetskaya Rossiya Sovkhoz in Gorodishchenskiy Rayon, V. Kusakin, states that the harvest work is proceeding in a harmonious manner. The sovkhoz was the first to ship more than 1,500 tons of grain to the Volgograd elevator for sale to the state. The Zakanal'nyy, Tingutinskiy and Gornaya Polyana sovkhozes followed its example.

It is interesting to visit a farm where the harvest work has been completed. We already have such farms and thus we must draw certain generalizations and

conclusions from the lessons of this year. Thus I met with the chief agronomist for the Rossiya Kolkhoz in Kalachevskiy Rayon, A. Yakovlev.

"We had 1,301 hectares of winter rye and wheat and we also had 3,700 hectares of spring wheat and barley. The winter crops furnished an average of 15 quintals per hectare and the spring crops -- 12 quintals per hectare. Certainly, greater yields could have been obtained. They could also have been smaller. Why? This year the grain crops are low and have almost no stalks. The ears are fairly good and yet in order to avoid losses the crop must be cut using the direct combining method."

"Certainly, the two-stage harvesting method has its advantages" continued Anatoliy Petrovich, "the grain is delivered in a dry state and there is no need to fuss with it on the threshing floor. Nor is there any need for drying work to be carried out at the elevators. Yes and the grain growers receive bonuses for quality. All this is true and yet what if the question is one of accepting or losing everything? Why rely upon an unsuitable method?"

"What has the year revealed?" I asked.

"It has confirmed an old truth: winter crops sown on fallow land produced reliable yields. It was almost on the order of a guarantee! This autumn we will increase our winter fields, despite the fact that we are unable to expand noticeably our fallow land areas. Yet these areas should be expanded! The state would obtain not less but more grain. Although no risk is involved, nevertheless our plans become paralyzed here."

These thoughts of agronomist Yakovlev are borne out by the experience accumulated over a period of many years by the team headed by M. Gavr at the Verkhnebuzinovskiy Sovkhoz in Kletskiy Rayon, by 3 years of experience by the Fifth Brigade of the Tingutinskiy Sovkhoz in Svetloyarskiy Rayon and by many other grain growing collectives. For example, we paid a visit to the Fifth Brigade at the Tingutinskiy Sovkhoz and witnessed the work being performed by the grain growers.

Only recently, 481 hectares of winter wheat were cut down and threshed here, with 27.2 quintals of grain being obtained from each hectare. This year the spring fields furnished yields that were tolerable but considerably less -- 10 quintals of grain. Moreover, this brigade has obtained rather high yields for several years in a row regardless of the weather.

"This time all of our winter crops were sown following fallow" explained the chief agronomist, V. Chaplygin, "The brigade has three crop rotation plans with a brief rotation and thus there is a large amount of fallow. True, the winter turned out to be a severe one, a portion of the winter crops perished and yet the spring crops sown on these same areas furnished 14-15 quintals and will produce raised yields for 1-2 years in succession. There is no need

for offering proof of the fact that the grain fields in the lower Volga region require fallow in like manner as they do air. Everyone knows this. Unfortunately, we are not able to use our own discretion in the planning of fallow land areas."

"How did you provide the brigade with such areas of rested land?"

"We simply concentrated one half of the fallow land set aside for the entire sovkhoz in one brigade. Although this was somewhat of a risky measure, nevertheless it provides support for a good grain balance for the farm and does not undermine it. This indicates that our reasonable risk can be employed on a large scale without losing anything."

At the present time, the harvest work is proceeding at a fine tempo throughout the oblast. Each day, grain is being obtained from an area of more than 120,000 hectares. The output of the harvesting units continues to rise higher.

Many farms are obtaining yields which 10 years ago were considered to be long wished for even during favorable years. The Ipatovo harvesting method is proving its worth in all areas. Yes, grain production in Volgogradskaya Oblast is moving forward. Yet it bears mentioning that the workers in Volgogradskaya Oblast can still obtain greater yields than they are now obtaining.

7026

CSO: 1824

IMPORTANCE OF TIMELY GRAIN HARVEST OPERATIONS STRESSED

Moscow TRUD in Russian 11 Jul 79 p 1

[Article by Ye. Zabotsev (Odesskaya Oblast): "A Harvest Without Losses"]

[Text] A detachment consisting of 10 combines at the Kolkhoz imeni Dmitrov in Tatarbunarskiy Rayon is obtaining 660-700 tons of grain daily. This is great output. But the machine operators are striving to raise this output to 100 tons per harvesting unit.

Last year, machine operator I. Grozdev, together with one of his fellow workers, completed his grain harvest in just 12 days, having obtained 1,222 tons of grain using his "Niva" machine. His working comrades wish to surpass these indices. What can assist them in this regard? First of all, there should be a high level of expertise, harmonious operations and the use of a strong reserve, one which is well known but not always utilized -- it consists of unloading the grain from the hoppers while the latter are moving.

Quite often the machine operators harbor the thought that there is no great loss in stopping for a period of 5 minutes. But these lost minutes must all be added up. The chief engineer for the oblast agricultural administration summed it up as follows:

"The hopper of a "Niva" or "Kolos" machine can hold 2,300 kilograms of grain. Let us assume that during the daytime period a combine operator threshes 100 tons of grain. If for some reason he does not wish to or he simply is unable to unload his hopper while moving, then it will be necessary for him to stop 43 times (duration of unloading 5 minutes). The loss in time will amount to 3 hours and 35 minutes. This period of time would be sufficient for harvesting 10-11 additional hectares and threshing 33 tons of grain."

Here are some figures which underscore the importance of making skillful use of the highly productive equipment. For a cropping power of 30 quintals per hectare, a "Niva" combine threshes 153 kilograms of grain

in just 1 minute. If the equipment lies idle for 5 minutes, 765 kilograms of grain are left unthreshed.

And how great are the losses sustained by a kolkhoz or the oblast? This then is why the workers attached to the oblast agricultural administration not only publicize the experience accumulated in the unloading of combines while moving, but in addition they furnish assistance in introducing this experience into operations in all areas. In order to facilitate the carrying out of such operations, special devices have been produced that enable a machine operator to position the chute of the unloading screw conveyer above the center of the truck body while the combine and truck are moving.

Nor are the machine operators the only ones that must learn how to conserve time. At the present time, an avalanche of grain is being delivered to the grain receiving points -- it is necessary only to make the required number of freight cars available. Meanwhile, many empty cars are lying idle at such stations as Akkarzha, Vygoda, Karpovo, Migayev, Veselyy Kut and others, owing to the fact that they have not been equipped with simple mechanisms for loading the grain into the freight cars through the upper hatches.

On the average, each of these freight cars is carrying 2,000 less kilograms of grain than it is capable of holding. "Records" have been established at the Izmail grain receiving point -- underloading by 5 tons and at the Bolgrad grain receiving point -- underloading by 8 tons of grain. At the same time, complaints are being registered at these points regarding a shortage of empty freight cars.

The thrifty use of each moment of time and skillful utilization of equipment serve as a reliable barrier against grain losses.

7026

CSO: 1824

FEED PRODUCTION PROBLEMS IN MOUNTAINOUS REGIONS

Moscow EKONOMIKA SEL'SKOGO KHOZYAYSTVA in Russian No 8, Aug 79 pp 31-38

[Article by Gushchyan]

[Text] The July (1978) Plenary Session of the CPSU Central Committee noted new methods of further development of USSR agriculture. In a decree of the Plenary Session of the CPSU Central Committee, adopted on 4 July 1978, the urgent problem "radically improve feed production and develop a reliable, firm feed base for livestock during the next few years on each kolkhoz, sovkhoz and interfarm enterprise" was posed to the agricultural workers.

Feed production is now undergoing a new step of its development--conversion to an industrial basis. And it is extremely important to accelerate this process and to organize interfarm associations and specialized enterprises on feed production and processing.

In light of the posed tasks, solution of economic problems of feed production throughout the country as a whole, including those in specific mountainous regions which occupy vast areas, acquires special significance.

The fodder base has been expanded and strengthened significantly during the past few years in the mountainous regions of the country, which served as a thrust for further development of livestock breeding. However, the rates of development of feed production still lag behind the increased needs of the population for livestock products. Comrade L. I. Brezhnev directly noted at the July (1987) Plenary Session of the CPSU Central Committee: "Cattle productivity remains low as before and the problem of providing the population with meat and milk products is being resolved slowly due to self-need production in the republics of the Transcaucasus and Central Asia."

The measures planned by the Plenary Session of the CPSU Central Committee to correct deficiencies and to create a firm foundation for intensive development of livestock breeding can be solved successfully only by studying all the problems of increasing feed production efficiency and quality improvement in the broad aspect.

As is known, having their own material and technical base and basic and circulating funds, feed production is one of the complex sectors of agriculture, emerging as a binding link between plant growing and livestock breeding. At the same time it is largely dependent on a number of sectors of industry since development of highly productive livestock breeding of the industrial type is senseless without complex mechanization of feed production and conversion of it to an industrial basis.

Like many agricultural products, feed is also a finished product, having its own costs. Having the property of a commercial product, feed is being brought more and more into the circulation of commercial and monetary relations and the pricing and cost-accounting system. However, being a circulating fund and object of labor, feed constantly requires improvement of production technology and qualitative improvement.

The characteristic features and prospects for developing feed production in mountainous regions of the country can be followed on the example of the Armenian SSR, where more than two-thirds of the agricultural lands on the kolkhozes and sovkhozes is used directly for feed production and more than half of the sown areas occupy plantings of feed crops. The cost of the feeds consumed here annually exceeds 128 million rubles, the feed harvesting and feed-preparation equipment exceeds 16 million rubles and the cost of basic funds of pasture irrigation facilities exceeds 24 million rubles. With regard to feed expenditures in livestock breeding, it utilizes an average of 47 percent. Field forage occupies 25 percent, meadow forage occupies 50 percent, industrially produced concentrates occupy 23 percent and miscellaneous feeds occupy 2 percent in the annual feed consumption structure.

The status and dependence of production indicators of livestock products on the fodder base in the union republics are characterized by the data of Table 1. As can be seen from it, the union republics differ sharply in the level of providing livestock breeding with feed resources, in the density of the cattle population and its productivity. The more feed is consumed, the more products are produced per conversion head of cattle and per unit of agricultural land. And the higher the density of the cattle population, the more intensively feed production must be developed.

The total fodder area of the country (plantings of feed crops, hayfields and pastures) exceeds 386 million hectares (70 percent of all agricultural lands), including 60-77 percent in the Transcausus Republics and 82-97 percent in Central Asian Republics. However, its productivity is rather low, frequently due to the arid climate. Plowed lands in the USSR with the required annual precipitation (700 mm or more) do not exceed 1.1 percent of their entire area, while in the United States they exceed 60 percent; moreover, the areas of plowed land with insufficient natural moisture (up to 400 mm) comprise 40 and 11 percent, respectively, in these countries. Therefore, problems of irrigation and flooding, especially in the vast southern regions of our country, acquire exceptional importance. We note that irrigated plantings of feed crops occupy 25-67 percent of their total area in the Transcausus Republics and 60-93 percent in Central Asia (compared to 7 percent throughout the country as a whole).

Table 1.

	(1) Общая коровник площадь	(2) млн. га	(3) в сельхозугодья (%)	Посевы коровника культуры ции зерновых (%)	(4) Расход коров- ников на 1 перен- водную голову скота в стадах (в перес. ед.)*	(5) в том числе всех коров	(6) в том числе концентратов	(7)	(8) Выход поголовья скота в стадах в периоде на 100 га сельхоз- угодий (тыс.)	(9) на 100 га сельхоз- угодий (тыс. руб.)	(10) на 1 переведенную голову скота и птицы (руб.)	(11) стоимость заготовленной про- дукции жи- вотного проис- хождения (в сопостав- ленных ценах 1973 г.) (руб.)	(12) Доля животноводства в общей рентабельности сельского хозяй- ства (%)	(13) Производство живот- новодства на 1000 населе- ния в селеногорье, ценах 1973 г. (руб.)
СССР (14)	386,1	70,1	30,4	26,2	8,7	24,9	11,0	444	51,0	237				
(15) РСФСР	112,6	51,4	30,3	25,5	8,8	31,6	14,2	450	57,7	200				
Украинская ССР (16)	17,9	42,4	33,1	26,8	9,3	67,7	31,7	468	48,5	272				
(17) Белорусская ССР	5,7	58,5	36,0	26,3	9,3	71,4	34,7	496	53,0	362				
Узбекская ССР (18)	22,6	86,2	15,9	27,1	8,2	15,0	5,5	304	25,7	100				
(19) Казахская ССР	164,4	86,2	26,5	29,2	5,9	6,1	2,2	362	53,2	293				
Грузинская ССР (20)	2,2	69,9	35,8	19,2	7,9	61,1	18,3	299	34,3	114				
(21) Азербайджанская ССР	2,5	60,5	28,9	19,2	5,7	53,7	14,0	260	32,3	100				
Литовская ССР (22)	2,1	59,3	43,6	29,2	12,7	71,8	47,0	665	64,5	507				
(23) Молдавская ССР	0,8	31,2	27,8	26,6	12,6	64,4	31,3	486	29,5	210				
Латвийская ССР (24)	1,3	58,4	47,2	27,4	11,2	65,9	42,0	637	67,1	418				
(25) Киргизская ССР	9,1	91,1	39,8	28,5	5,6	21,8	7,2	332	52,7	210				
Таджикская ССР (26)	3,4	82,7	24,7	23,1	6,5	32,8	9,3	284	30,3	107				
(27) Армянская ССР	1,0	76,9	47,7	23,5	6,6	79,4	25,7	324	47,2	117				
Туркменская ССР (28)	29,5	97,0	22,4	29,1	7,2	3,5	1,2	349	33,2	142				
(29) Эстонская ССР	0,9	61,7	45,1	27,9	14,2	63,3	48,5	710	68,1	504				

* Data are presented for the public sector

Key:

1. Total feed area
2. Million hectares
3. In agricultural lands (percent)
4. Plantings of feed crops to total plantings (percent)
5. Feed consumption per conversion head of cattle and poultry (quintals of feed units)
6. Of all feeds
7. Including concentrates
8. Yield per head of cattle and poultry converted to 100 hectares of agricultural land (per head)
9. Cost of gross livestock products (in 1973 comparative prices)
10. Per 100 ha of agricultural lands (thousands of rubles)
11. Per one conversion head of cattle and poultry (rubles)
12. Fraction of livestock in total gross agricultural products (percent)
13. Production of livestock products in 1973 comparative prices (rubles)
14. USSR
15. RFSRF
16. Ukrainian SSR
17. Belorussian SSR
18. Uzbek SSR
19. Kazakh SSR
20. Georgian SSR
21. Azerbaijan SSR
22. Lithuanian SSR
23. Moldavian SSR
24. Latvian SSR
25. Kirghiz SSR
26. Tadzhik SSR
27. Armenian SSR
28. Turkmen SSR
29. Estonian SSR

The main cause of low livestock productivity in the Transcaucus Republic is its inadequate support with feeds, especially succulent feeds and concentrates. Considerably fewer feeds are consumed annually on the Transcaucus kolkhozes and sovkhozes per conversion head of cattle and poultry than the average throughout the country.

The July (1978) Plenary Session of the Central Committee of the Armenian Communist Party noted the poor development of the fodder base in the republic and worked out measures to solve a difficult, but feasible task--bring the volume of feed consumption per conversion head of cattle and poultry up to 30-35 qt of feed units on the farms during the next few years compared to 25.8 qt in 1977.

Plantings of feed crops have been expanded significantly and the combifeed industry has begun to develop. During the period 1940-1977, the total plantings were expanded in our country by 45 percent, including 15.6 percent for grain crops. Plantings of feed crops increased by a factor of 3.7 during this period and their specific weight increased to 30.6 percent in total plantings. Plantings of feed crops were expanded by a factor of 5.3 during this time in Armenia, with an increase of their specific weight from 8.8 to 50 percent. A similar situation is also observed in the other Transcausus Republics.

The rapid growth of feed crop plantings is explained by the increasing need of livestock raising for feeds. The problem of feed accumulation can be primarily resolved due to a maximum increase of the yield of feed crops and improvement of feed quality.

Plantings of feed crops should be expanded, especially in regions not provided with their own grainforage (Transcausus and others) by developing new idle lands and bringing new ones into agricultural rotation of the cultivable part, which reached large dimensions. For example, the areas of agricultural lands (plowed lands, pastures and so on) comprising 500,000 hectares were written off for various reasons in Armenia during 1956-1973. The area of saline, wet and rocky lands subject to development comprises approximately 90,000 hectares here.

They frequently resort unjustifiably to diversification of crops in the southern regions of the country, sometimes putting perennial plantings on sections with unfavorable soil and climatic conditions which provide a yield of only 4-5 qt per hectare. But the given areas, which reach several thousand hectares, could be used to develop the fodder base with a higher return. The practice of planting trees in forest clearings and on slopes which serve as good feed lands has also not been justified.

The dynamics of feed production and provision of livestock raising with feeds in the Armenian SSR are characterized by the data of Table 2. As can be seen from the table, although the consumption of feeds somewhat outstrips the growth rate of the cattle population, livestock raising is still not completely

provided with feeds. At the same time, unlike the consumption of purchased concentrates, production and consumption of self-grown feeds are increasing slowly. The cost of feeds continues to increase and their return remains low. All this has a negative effect on the profitability of livestock raising, which was increased somewhat, but is still far below the optimum level. The highest specific weight in the structure of feed costs is occupied by labor expenditures (an average of 35 percent), whereas expenditures for mechanization and fertilizer do not exceed 19 percent.

Table 2.

Показатели (1)	(2) В среднем за		1976 г.	1977 г.	1977 г. в % 1966— 1970 гг.
	1966— 1970 гг.	1971— 1973 гг.			
(4) Поголовье скота и птицы в периоде на условную голову (тыс. гол.)	581,6	647,8	693,2	707,9	121,7
Расход всех видов кормов в кормовых единицах (тыс. т) (5)	1270,6	1558,9	1640,0	1630,7	144,1
в т. ч. концентрированных (тыс. т) (6)	225	345	430	480	213,3
Расход всех видов кормов на 1 переведенную голову в кормоединицах (кг) (7)	2185	2407	2366	2546	118,4
в т. ч. концентрированных (кг) (8)	387	533	620	678	175,2
Стоимость валовой продукции животноводства в сопоставимых ценах 1973 г. (млн. руб.) (9)	143,7	183,3	213,7	231,7	161,2
То же, в расчете на 1 ц корм. ед. израсходованных кормов (руб.) (10)	11,3	11,8	13,0	12,7	112,4
Доля животноводства в общей стоимости валовой продукции сельского хозяйства (%) (11)	40,7	41,6	41,4	41,7	—
Производство полевых кормов на 1 га посева зерновых культур (ц корм. ед.) (12)	16,0	16,5	17,4	18,7	116,9
Себестоимость производства 1 ц корм. ед. полевых кормов и сена естественных сенокосов (руб.) (13)	7,15	8,0	8,74	8,78	122,8

Key:

1. Indices
2. Average during
3. 1977 in percent of 1966-1970
4. Head of cattle and poultry converted to condition head (thousand head)
5. Consumption of all types of feeds in feed units (thousand tons)
6. Including concentrated feeds (thousand tons)
7. Consumption of all types of feeds per conversion head in feed units (kilograms)
8. Including concentrated feeds (kg)
9. Cost of gross livestock products in 1973 comparative prices (million rubles)
10. The same calculated per quintal of feed unit of consumed feeds (rubles)
11. Fraction of livestock in total cost of gross agricultural products (percent)
12. Production of field fodders per hectare of feed crop planting (qt of feed units)
13. Cost of producing 1 qt of feed unit of field fodders and hay of natural hayfields (rubles)

The main problems of developing field and meadow feed production in mountainous regions are closely related to solving problems of intensification, specifically of irrigation, fertilization and mechanization, acceleration of scientific and technical progress and increasing labor productivity. In this case total use of reserves and capacities for expanding the fodder area and of increasing its productivity will make it possible to increase the volume of feed production in the near future by more than a factor of 1.5-2 and will permit a significant improvement of quality.

The following approved scheme of efficient organization of field fodder production (see Table 3) can be recommended to the farms of the mountainous regions of the Transcaucasus, Central Asia, Northern Caucasus, the Crimea and so on, distinguished by diverse conditions and vertical terrace land use. The given indicators are normative in nature and may serve as an example of planning feed production on farms.

Extensive possibilities and prospects are opened up when intermediate plantings (after harvest, after mowing, repeated and packed) of a number of feed and food crops on irrigated lands in the south of the country and with universal conversion from clean plantings of feed crops to mixed crops. The indicated plantings are carried out annually on an area of 3,500-4,000 ha on the kolkhozes and sovkhozes of the Ararat Valley, which produces a significant saving. The average yield of green mass of after-harvest planting of corn comprised 126 qt per hectare here over a number of years and spring planting of it, which occupies the field during the entire vegetation period, comprised 230 qt; the cost of 1 qt comprised 1.0 and 1.30 ruble, respectively.

Instructive experience on expanding the production of green corn mass and replacing spring planting by summer after-harvest planting exists on the farms of Echmiadzinskiy Rayon, where spring planting of corn occupied 402 ha and after-harvest planting occupied 1,000 ha; the yield of grain mass comprised 169 and 130 qt, respectively, and the cost of 1 qt was 0.77 and 0.5 ruble. However, irrigated lands are not being utilized adequately to produce two crops on many farms, especially on the sovkhozes. This is obvious from the fact that irrigated plantings of agricultural crops on the communal farms of Armenia occupy 150,000 ha, while intermediate plantings occupy only 3.0 percent of their entire area. It should be noted that repeat and packed plantings reached 35 percent of the irrigated land in the leading regions of the country and in some countries, for example in the Peoples Republic of Bulgaria, they are even higher--up to 70 percent.

Study of the prospects shows that intermediate plantings can be brought up to 22,000 hectares in the irrigated regions of the Ararat Valley and the foothills zone of Armenia, allocating 16,000 ha to fodder crops and 6,000 ha to feed crops and to produce not less than an additional 200,000 tons of green corn mass and 60,000 tons of vegetables annually for the populace with a total cost of 4.0 million rubles. The experience of the leading farms of Kaliniskiy and Stepanavanskiy rayons of the high-mountain zone, which cultivate mixed plantings of peas with oats or vetch with barley for winter feed on sufficiently wet lands (after harvesting of winter grain crops), thus providing two-crop production.

Table 3.

(1) Культуры и способы их посева (чистый, смешанный и промежуточный)	(2) Структура посева на зернодобывающие и зеленые культуры посев	(3) Урожайность с 1 га (кг)		(6) Выход с 1 га посева		(9) Чистый от посева до посева по саженцам
		(4) основная	(5) побочная	(7) корнеплоды или бахчевые	(8) передвижного протек- тия, кг	

1. НИЗИННЫЙ ОРОШАЕМЫЙ ПОЯС
(Араратская долина, 700—1000 м над уровнем моря)

(13) Многолетние травы на сено — смесь бобовых (люцерна) и злаковых (житняк, тимофеевка)	60	100	—	50,0	600	
Зерновые озимые (пшеница, ячмень) на зерно + кукуруза на зеленую массу с соей (14)	15	40+280	80	65,2	872	
Озимая рожь или ячмень, шабдар, вика + кукуруза с соей на зеленую массу (15)	10	220+280	—	90,0	928	64 715
Рапс или шабдар, рожь с викой + корнеплоды корнеплоды или бахчевые (16)	5	210+350	110	106,8	1060	
Рапс или рожь с викой, шабдар + кукуруза на зеленую массу с соей (17)	5	220+280	—	90,4	1280	
Озимая рожь или ячмень с викой, шабдар + кукуруза с соей на зеленую массу (18)	5	220+280	—	90,0	888	

2. ПРЕДГОРНЫЙ ПОЯС (500—1500 м над уровнем моря)
а) на орошаемых землях (20)

(21) Многолетние травы на сено (смесь бобовых и злаковых)	50	80	—	36,8	480	
Озимые зерновые на зерно (пшеница, ячмень) + кукуруза с соей на зеленую массу (22)	25	30+250	50	79,5	658	
Озимый ячмень или рожь с викой, шабдар, рапс + кукуруза с соей на зеленую массу (23)	10	200+250	—	81,0	800	58 619
Шабдар с ячменем, рапс на зеленую массу + корнеплоды корнеплоды или бахчевые (24)	10	200+300	80	81,0	920	
Озимая рожь с викой или рапс, шабдар + кукуруза с соей на зеленую массу (25)	5	190+250	—	78,5	882	

[Key on following page]

[Table 3 Continued]

б) на богарных землях (26)

(27) Многолетние травы на сено — смесь бобовых (клопшт.) и злаковых (житняк, тимофеевка)	70	35	—	16,8	227		
Однолетние травы на зеленую массу (смесь бобовых — горох или вика с рожью или овсом, ячменем) (28)	25	210	—	40,0	440	24	292
Кукуруза с соей на зеленую массу (29)	5	210	—	42,0	462		

3. ГОРНЫЙ ПОЯС (1500—2300 м над уровнем моря) (30)

а) на орошаемых землях (20)

(31) Многолетние травы на сено (смесь бобовых и злаковых)	50	50	—	24,0	325		
Однолетние травы на зеленую массу (смесь бобовых и злаковых) (32)	25	210	—	42,0	462		
Кукуруза на зеленую массу (33)	10	220	—	39,6	331	31	378
Кормовые корнеплоды (34)	10	350	110	53,0	515		
Силосные (подсолнечник, топинамбур на внесенооборотных участках) (35)	5	280	—	30,0	320		

б) на богарных землях (26)

(31) Многолетние травы на сено (смесь бобовых и злаковых)	75	30	—	15,0	195		
Однолетние травы на зеленую массу (смесь бобовых и злаковых) (32)	20	150	—	26,0	286	18	214
Соевые (подсолнечник, топинамбур на внесенооборотных участках) (35)	5	150	—	21,0	225		

Key:

1. Crops and methods of planting them (pure, mixed and intermediate)
2. Structure of sown areas (percent of totals of given belt)
3. Yield per hectare (qt)
4. Basic
5. Miscellaneous
6. Yield per hectare of planting
7. Feed unit, qt
8. Digestible protein, kg
9. Yield per hectare of planting by belts
10. Feed units, qt
11. Digestible protein, kg
12. Lowland irrigated belt (Ararat Valley, 700-1,000 m above sea level)
13. Perennial grasses for hay--mixture of legumes (alfalfa) and cereal (wheat grass and timothy)
14. Winter grain crops (wheat and barley) for grain plus green mass with soybeans
15. Winter rye or barley, Persian clover, vetch plus corn with soybeans for green mass

(Key continued on following page)

[Key continued]

16. Rape or Persian clover, rye with vetch plus feed root crops or melons
17. Rape or rye with vetch, Persian clover plus corn for green mass with soybeans
18. Winter rye or barley with vetch, Persian clover plus corn with soybeans for green mass
19. Foothills belt (500-1,500 meters above sea level)
20. On irrigated lands
21. Perennial grasses for hay (mixture of legumes and cereals)
22. Winter grain crops (wheat and barley) plus corn with soybeans for green mass
23. Winter barley or rye with vetch, Persian clover and rape plus corn with soybeans for green mass
24. Persian clover with barley, rape for green mass plus feed root crops or melons
25. Winter rye with vetch or rape, Persian clover plus corn with soybeans for green mass
26. On dry lands
27. Perennial grasses for hay--mixture of legumes (sainfoin) and cereals (wheat grass and timothy)
28. Annual grasses for green mass (mixture of legumes--peas or vetch with rye or oats and barley)
29. Corn with soybeans for green mass
30. Mountain belt (1,500-2,300 meters above sea level)
31. Perennial grasses for hay (mixture of legumes and cereals)
32. Annual grasses for green mass (mixture of legumes and cereals)
33. Corn for green mass
34. Feed root crops
35. Silage (sunflowers and Jerusalem artichokes on nonrotated plots)

Practice showed that intermediate plantings can be made on those irrigated lands where the vegetation period of the plants lasts for 60-70 days after harvesting of the first yield of crops prior to fall frosts (it actually comprises 90-120 days in the lowlands and the annual precipitation reaches 700 mm or more in the dry mountainous regions). Intermediate plantings of agricultural crops can be expanded significantly and can be brought up to 1 million ha (or approximately 35 percent of the irrigated plowed area) in the irrigated regions of the southern part of the country. This is a significant reserve for increasing feed production and nutritional products worth approximately 190 million rubles annually. Solution of the given problem is primarily related to timely plantings and harvest of crops, provision of summer plantings with irrigation water and fertilizers and extensive mechanization of labor. A time saving is very important in this case since any delay of the summer planting periods inevitably leads to a decrease of the yield and a reduction of quality. It has been proven that each lost day in summer is equal to 10 days of the last after-harvest period.

Extensive development of intermediate plantings directed toward increasing the intensification of field cropping assumes efficient use of land, equipment, irrigation water and the work force. Therefore, planning and agricultural bodies and the kolkhozes and sovkhozes of the republics of the Transcaucus, Central Asia and so on should develop and implement in planned order specific measures for maximum expansion of intermediate plantings and two-crop production.

An increase in the productivity of natural fodder lands, which comprise the fodder base of the mountainous regions, is inseparably related to implementation of complex measures on efficient use of them. Work is being carried out in this direction, but it is frequently limited in nature. Much time is still required to solve these problems in all areas. The pasturage and pastures of mountainous regions are frequently overloaded with cattle, which has a negative effect on the productivity of the animals and of their overall condition. For example, the load of pasturage per hectare comprises an average of 1.3 head of grazing animals in conversion to conditional adult head of cattle compared to the permissible norm of 0.8 head in Armenia.

Efficient organization of mountainous meadow and pasture management has its own specific features by making an imprint on development of livestock raising. Uniform disposition of meadow and pasture tracts by regions and also of winter (fall-spring) pastures and the acute need of farms for pasturage led to intra- and interregional use of high-altitude summer and winter pastures of the state land fund. For example, summer pastures (and also hay fields and partially plowed lands) of the State Land Fund, which comprised 40 percent of all pasturage and pastures, are utilized by the farms of four rayons in its own region in Armenia. And besides their own rayons, the farms of 14 rayons utilize pastures of the state fund in one other rayon; the farms of six rayons utilize them in two rayons; the farms of six rayons utilize them in three rayons; the farms of five rayons utilize them in four rayons; and the farms of two rayons utilize them in five rayons. More or less uniform load of pastures has been established due to the practical flexible form of land use in all the rayons and on the farms, which contributed to an increase in the density of head of cattle. Stopping the unjustified practice of interrepublic use of summer and winter pastures of the state fund since 1965 in the Transcaucus also had a positive effect.

The following main systems of pasture use were established due to intra- and interrayon and vertical-belt land use in mountainous regions: near (stationary) and distant, in turn divided into two-, three- and four-belt. Several systems of belt management of pasturage may be used simultaneously on the same farm, namely: one system for one type or production group of animals and another system for another type or group of animals. Therefore, one should take a differentiated approach to efficient organization of pasture use.

Vertical-belt systems and the related intra- and interrayon forms of natural fodderland use have a number of advantages which are economically justified. In this case, intelligently dispersing the cattle population on pastures and constantly maintaining them close to food sources, it becomes possible to

develop a natural inexpensive green conveyor, which mainly provides the needs of the cattle for pasturage from spring to late fall, to regulate the load of the pastures, to extend the pasturage season, to reduce expenditures for animal maintenance, to increase the production of high quality products with low cost and to economize on expensive winter feeds. Consequently, managing livestock in vertical belts in combination with the use of field, concentrated and other feeds is the most feasible and advantageous system. At the same time, the indicated systems of pasture use require improvement. I have in mind the need for further intensification of meadow and pasture management, development of it, partial redistribution of pastures, creation of the necessary seed fund and the use of pasture and hayfield rotation.

One must also not forget that failure to use each 100 ha of pastures in the upper belts requires an additional increase (by approximately 23 ha) of plowing for planting food crops in the lower belts or consumption of stall feeds at a rate of 100 qt of feed units costing 3,200 rubles annually. Therefore, the extensive use of natural fodder lands should be provided in the technology of livestock breeding complexes, interfarm enterprises and kolkhoz-sovkhoz cattle- and sheep-breeding farms. Complexes and interfarm enterprises with stationary maintenance of livestock can be organized on newly developed irrigated lands with their own fodder base at the farm. In these cases the consumption of purchased concentrated feeds may comprise 30-35 percent of the total annual need for feed.

Expansion of work to construct roads, livestock breeding and cultural-service objects, watering sources, liquid manure pits and also to supply electric power and radio telephone communications are especially important. Certification of natural fodder lands must be carried out periodically for this purpose, and areas, yield, the dynamics of increase and the nature of the grass stand and the required volume of capital investments on irrigation, flooding and equipment must be refined. All these and other measures which cannot be postponed are subject to development and inclusion in the development plans of meadow-pasture management. In this regard it is feasible to reconsider the problem of creating meadow-pasture reclamation trusts attached to the ministries of agriculture of the Transcaucasian republics, with production subdivisions in rayons named to implement measures to improve meadows and pastures.

To avoid lack of responsibility, the land users themselves should be responsible for their improvement with interrayon use of fodder lands. But the administration of the rayon, which contains lands of the state fund, called upon to monitor solution of the problem of feed production, should not stand on the sidelines.

With vertical-belt land use for correct combination of plant growing and livestock raising and to solve the resulting arguments, it is recommended in planning the fodder base that one proceed primarily from the principle of total use of natural fodder lands of the upper belts attached to the farm (rayon), providing an optimum load of pastures with cattle. Land areas for field feed production should be allocated in the foothills built only after

this. The remaining plowed lands here can be allocated for other plant crops.

Due to crop-technical operations and development of new areas, the mowing area of natural hayfields can be expanded by 30,000 ha in Armenia, bringing it up to 165,000 ha, and in this case the yield can be brought up to 26 qt per hectare and at the same time meadow hay production can be doubled. Mountain pastures largely require surface rather than fundamental improvement due to the characteristic features of the relief and soil cover. Thus, fundamental improvement of pastures should be carried out on an area of 40,000-50,000 ha, while surface improvement should be carried out on an area of 550,000 ha in Armenia. Besides this, approximately 100,000 additional ha of pastures can be expanded and brought into agricultural rotation by using marginal lands. Implementation of the indicated measures will make it possible to increase the yield and the net harvest of pasture feed from 3.2 to 5.9 million tons.

The greatest effect in solving the problem of increasing yield is provided by application of organic and mineral fertilizers. Calculations showed that no less than 600,000 additional tons of hay costing 1.61 rubles per quintal can be produced in Armenia with application of the indicated fertilizers on the hayfields and pastures located in belts with sufficient moisture. The annual net income comprises 3.2 million rubles in this case and the standard of profitability comprises 32 percent. Special attention should be devoted in this case to efficient use of mineral and maximum accumulation and application of organic fertilizers to the soil. A total of 4.6 million tons of organic fertilizers can be applied to the soil annually on the kolkhozes and sovkhozes of Armenia (compared to 1.5 million tons actually applied at present). Higher plans for use of organic fertilizers must be worked out, liquid manure pits should be constructed on all farms and production processes should be mechanized. The characteristic features of difficultly accessible mountainous regions make it necessary to utilize agricultural aviation extensively for planting grasses and application of mineral fertilizers and trace elements on meadows and pastures.

An increase of labor productivity feed production is closely related to maximum mechanization of it. However, the level of mechanization of haying and gathering and stacking of rough fodders is still rather low, fluctuating from 22 to 54 percent on the farms of Armenia. There is a special shortage of low mechanization equipment in the mountainous regions and new progressive methods of procurement and use of feeds are being poorly introduced here. At least the fact that the energy equipping of a single worker comprises 9.3 horsepower (compared to an average of 18.1 horsepower throughout the country) indicates this.

Investigations are being conducted in the republic to find new forms and methods of labor to provide efficient use of agricultural equipment which services feed production. For example, the cost-accounting association for complex maintenance of 24 kolkhozes and sovkhozes has been operating

successfully on contract beginnings for the third year in the high-altitude livestock raising Vardenisskiy Rayon. The new association, utilizing the Ipatova method, is conducting extensive work on the farms of the region in feed production, improvement of hayfields and pastures and providing in this case comparatively high labor productivity.

One of the conditions of the successful activity of interfarm livestock raising enterprises and complexes is creation of their own fodder base by allocation of the appropriate land area for them. Interfarm livestock raising enterprises and complexes can be created on newly irrigated lands occupying vast areas and also on the basis of economically weak kolkhozes and sovkhozes provided that, for example, approximately 1,000 ha of pastures and 910 tons of concentrated feed annually are allocated to the enterprises to raise 2,000 head of young cattle.

The interests of strengthening the fodder base require further expansion of the network of interfarm and state enterprises (sovkhозes) for feed production, primarily on newly irrigated lands. Special attention should be devoted in this case to observing their optimum dimensions and complex solution of management problems.

Expanding from year to year, feed production has acquired large scales, but the forms of labor organization and material incentives in it have remained almost unchanged. Field cropping brigades have recently begun to be reorganized to larger, permanently operating specialized brigades on feed production, supplied with modern equipment, with regard to the new requirements on the livestock raising farms of the republic. And permanently operating sections have begun to be created among plant growing brigades on farms with small farmsteads. Sowing of feed crops, hay and pasture, feed harvesting equipment, feed shops, a working force and other means are usually attached to the indicated brigades (sections). Their main task is successful fulfillment of the assignment to increase feed production and to improve feed quality, to provide scientific and technical progress and an increase of labor productivity in the sector.

A laboratory to determine feed quality must be created in each region (zone) to increase the responsibility of feed production workers for retaining nutrition content and to improve the quality of feeds. At the same time, the farms should decisively reject the harmful practice of storing feeds under the open sky and should resort to construction of special feed storehouses, as is done, for example, at the Yekhvard complex and the leading farms of Shaumyanskiy Rayon. Measures to increase the material incentives to workers responsible for the quality, production efficiency and storage of feeds and also establishment of calculated prices for the produced feeds also acquire important significance.

The July (1978) Plenary Session of the CPSU Central Committee made an important decision--"Increase the capacities and production of combifeeds at state and interfarm enterprises as rapidly as possible. See that practically all

the grain going to the needs of livestock raising is fed in converted and balanced form during the next five-year plan." It is especially important in this regard to solve the problem of developing the combifeed industry in the mountainous regions, specifically of proper selection of the trends of its development. Problems of efficient disposition and specialization of combifeed enterprises, support of them with raw material, improvement of quality and variety and reduction of the combifeed cost should be carefully thought out. Construction not only of kolkhoz-sovkhoz, but also of inter-farm combifeed plants (shops) is felt to be unfeasible due to the absence of their own feed grain in Armenia. In place of this, it is feasible on individual livestock raising farms to have their own mechanized feed shops which produce feed mixtures and granules.

In regions which do not have their own grain (the Transcaucasion republics and others), the combifeed industry can be developed by construction of new and expansion of existing state combifeed plants based on imported raw material. For example, a scheme for disposition and construction of combifeed plants in the main zones has been developed with regard to accelerating the rates of livestock development in Armenia which permits an increase of combifeed production up to 1.8 million tons or by a factor of 3. It is planned to construct a specialized plant for continuous supply with the necessary premixes and protein supplements. The farms will turn over their available reserves of feed grain and other types of raw material to the plants of their service zone for production of combifeeds, which will permit elimination of the harmful practice of using grain for feed in pure form. It is also planned to bring over and to expand processing and feeding of food wastes to cattle. Implementation of the given program will make it possible in the future to increase the consumption of combifeeds in the republic per conversion head of cattle and poultry from 4.6 to 8 qt, which will completely provide the needs of livestock raising.

According to data of the Armenian NIIZhV [Scientific Research Institute of Livestock Raising], the following minimum amount of feed units per ton can be saved on the farms of Armenia by using progressive production methods, processing and storage of feeds: 75 kg in hay procurement, 35 and 25 kg in establishing haylage and silage, 40 kg in processing grass meal into granules, 15 kg in storage of succulent feeds and 45 kg in storage of concentrated feeds (grainforage and combifeed). As shown by the calculations of specialists, the total annual saving of feeds on communal farms will comprise no less than 96,500 tons of feed units (or 9.2 percent of all stall feeds) costing 9.8 million rubles. The annual saving of feeds in the Georgian SSR may reach approximately 129,400 tons of feed units and the saving in the Azerbaijan SSR may reach 138,600 tons of feed units.

The interests of the matter require that one fully involved in problems of training cadres of workers engaged in field, meadow-pasture and industrial feed production and that their qualifications be raised.

Implementation of the indicated measures will permit a significant improvement in the production of livestock products.

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PLANT PROTECTION UNDER CONDITIONS OF SPECIALIZATION, CONCENTRATION

Moscow ZASHCHITA RASTENIY in Russian No 8, Aug 79 pp 26-28

[Article by V. F. Samersov, director of BelNIIZR [Belorussian Scientific Research Institute of Grain Crops]: "Under Conditions of Intensification and Specialization"]

[Text] The specialization and concentration of agricultural production and the radical technological changes related to them are creating a number of priority tasks involving plant protection. The growing volume of chemicals (mineral fertilizers, growth regulators, pesticides, chemical ameliorants, and others), the introduction of intensive varieties, the change in the quality and schemes for soil cultivation, etc. extensively alter the microclimate of agrobiocenosa and the level and intensity of existing inter-relations between plant and animal organisms. The study and evaluation of these changes is the basis for a system of protective measures. For this reason scientists and specialists should bring plant protection up to the same level as the new stage of agricultural development.

Because of the long-term use of herbicides from the 2,4-D group weeds that are resistant to the group have spread. In Belorussia a strain of the Colorado potato beetle has developed that is resistant to widely-used chlor-organic insecticides (PKhP and PKhK). Under conditions of specialization and concentration the proportion of some crops in the crop rotation increases, which changes the variety composition of pathogenic agents, pests and especially weeds. The data from scientific research establishments shows that in the republic there are 85-300 weeds per 1 square meter of main crops. This is much higher than the critical levels. In order to increase the effectiveness of a complex of measures it is very important to precisely determine the composition of the weed flora of each field on the basis of periodic surveys of the weeds and of maps. The scale of such work still does not satisfy the requirements of modern farming. Complex problems arise with the introduction of new technologies for soil cultivation (zero and minimal).

It is also essential to account for the species of pathogens and pests, their infection load and number per season as well as over the long term while considering the tendencies of specialization in enterprises. Under the

conditions of production intensification the long-term suppression of the quantity of harmful organisms is achieved only with the complex utilization of prophylactic and destructive measures. The basic elements of integrated systems of plant protection are the following: agrotechnical measures which either avoid or suppress the development of harmful organisms; cultivating resistant varieties; increasing the activeness of organisms which regulate the quantity of pests, disease-carrying organisms and weeds; active measures to suppress the number of harmful organisms (biological, chemical, other) while considering their expected development and economic losses.

The concentration of agriculture is bringing changes to the technology of cultivating the most important crops. The proportion of grains is increasing within the structure of sowing areas (in Belorussia it is now 54.1 percent). This has resulted in significant changes in the distribution and harmfulness of pathogenic organisms. In comparison with the period up to 1965 there has been an increase in the harmfulness of snow mold, root rot and smut diseases. Thus, in 1978 root rot was found on grain crops everywhere. The development of the disease on barley was 6.8-7.2 percent (varieties El'gin, Nadya) and 2.7-4.5 percent (Al'za, Mami). The intensity of infection of winter wheat reached 14.3-24.8 percent, of winter rye--20.1 percent. The development of snow mold fluctuated from 21.0 to 40.5 percent according to zones. According to the data of S. F. Bug, the average percentage of distribution of loose smut was 1.42. In recent years there has been a growth in the distribution of rhynchosporiosis and powdery mildew on barley varieties developed abroad. With the growth in the area in spring wheat there is an increasing danger of septoria spots. A change has also taken place in the structure of entomo-fauna. There has been a decrease in the harmfulness of snapping beetles, cutworms, pseudo-snapping beetles, cereal flies (frit fly and green-eyed fly) in connection with the optimization of the sowing schedule and soil cultivation and with the increase in the quantity of mineral fertilizer. At the same time there has been a sharp rise in the harmfulness of suctoria (large greenbug, chokecherry aphid, rye thrips, fruitless flower thrips, leafhopper), especially if the nitrogen dose is increased. Frit flies do less damage to oats and barley during the primary stages of organogenesis but more damage to the grains. This is related to the organotropic adaptation of insects and to the changing conditions in the environment.

The most important element in the system of plant protection is the hardiness of plant varieties to diseases and pests. The intensive introduction into the republic's grain production of varieties that were developed abroad and that are susceptible to loose smut (Mami, Nadva, El'gin) without a preliminary phytoentomological evaluation has increased the harmfulness of the disease. The Delta winter rye variety, which is good according to general indicators, is not resistant to snow mold. This makes it necessary to resow large areas in the northeastern rayons annually. We feel that it would be expedient to evaluate new varieties of grain crops (in infectious environments) for resistance to the most dangerous diseases and pests before regionalizing them. This is especially important for foreign varieties because their resistance can be easily eliminated by local varieties of phytopathogenes.

The practical experience gained in plant protection demonstrates that only the systematic, timely and quality fulfillment of the complex of agrotechnical methods planned in the technology of crop cultivation eliminates harvest losses and retains its quality with minimal expenditures. Many agrotechnical devices not only increase the yield themselves, but also create conditions which improve the resistance of plants to pests and diseases, retain useful insects and have a negative effect on pests, sources of diseases and weeds, thereby limiting the necessity of utilizing destructive measures. The methods are well-known: crop fluctuation; soil cultivation; sowing schedule; the norms for applying fertilizer, etc. But under the conditions of concentration and specialization of agricultural production new tasks arise, and because of the high level of energy supplies and mechanization the possibility of utilizing them exists as well.

With the example of grain crops it is evident that the realization of the set tasks requires an analysis of the effect of all ecological factors on the development of pests and disease sources in field biocoenoses. Changes in the growth pace and biochemical composition of plants affected by fertilizers influenced the formation of populations of harmful organisms. In tests of BelNIIZR with a planned yield of 40-45 quintals per hectare it was determined that with a sowing norm of 3 million-4 million germinating seeds there is a decrease in the number of suctorial insects and in the development of root rot and an increase in plant infestation with intra-stem pests. When the sowing rate is increased the opposite is true. From the phytosanitary point of view when there is a high fertility level it is most expedient to sow 3 million-4 million germinated seeds. The harvest effectiveness here is not lower than with a rate of 5 million to 7 million because with an increase in the level of mineral nutrition there is a growth in the compensatory capabilities of infected plants. N. A. Luban' showed that increased doses of mineral fertilizers strengthen the compensatory capabilities of oats and barley plants infested with the frit fly, which significantly decreases its harmfulness. The basic compensation for losses in yield come from an increase in the number of productive stems and in the weight of the grain. Thus, if the weight of a grain from one infected plant in the control was 1.82 grams for barley and 1.62 grams for oats, with the introduction of N60P60K90 it increased to 2.56 and 2.14 grams respectively; with a double dose of NPK-- by 3.24 and 2.47 grams.

Crop rotations play a large role in limiting the number of pests, pathogens and weeds. The concentration of grain production calls for an increase in the area sown in grain crops, especially barley. This results in the growth of infection with root rots and to significant underproduction. According to data from the phytopathology laboratory, in order to avoid extensive losses it is essential to maintain a 2-year interval for cultivating spike crops. This is possible even for crop rotations with a high saturation of such crops (up to 72 percent). It has been determined that oats crops have a great sanitation effectiveness regarding disease sources and it must occupy a more fitting position as a sanitizing agent in fields.

In Belorussia over 700,000 tons of seeds are disinfected annually. The tasks of grain production and the transition of seed farming to an industrial basis require the development and introduction of a technology for disinfecting seeds, for their transport and storage securing a high effectiveness and quality and maximal safety for people and the environment. The long-term storage of large quantities of disinfected seeds is a complicated matter. Special bunkers can be utilized. Experiments set up jointly with TsNIIIMESKh [Central Scientific Research Institute of Rural Mechanization and Electrification of the Non-Black Earth Belt of the USSR] at the Ganusovskaya Experimental Selection Station indicate the disinfection of seeds in bunkers proceeds significantly more rapidly. This permits us to curtail the schedule for treatment in good time. Moreover, in utilizing bunkers there is an increased possibility of full mechanization and automation for disinfection. It is necessary that biologists, engineers as well as specialists of agricultural production work on this problem. At the present time the disinfection of seeds (chemical and thermal) is a mandatory method for preparing seeds for sowing. However, it is usually done without preliminary phyto-examination of the seeds and with a uniform disinfection norm.

The results of tests by BelNIIZR show that depending upon the basic degree of infection, seeds can be given differentiated doses of granozan ranging from 0.5 to 1.5 kilograms per ton (N. N. Lukashik). It has been established that with a 40 percent infection of barley with helminthosporiosis the field germinating capacity can decrease by 14 percent; with one of over 70 percent--by 23 percent. Disinfecting the seeds with granozan enables farmers to fully reestablish the sowing and reproductive qualities of seeds. For example, a batch of barley of the Al'za variety from the 1978 harvest of the Progress Experimental Base, Glubokskiy Rayon, Vitabskaya Oblast, had a laboratory germination capacity of 82 percent and a vitality of 94 percent. Over 80 percent of the seeds were infected. After treatment with granozan the infection was completely eliminated and the germination capacity increased to 94 percent.

In the fight against loose smut the thermal disinfection of seeds is utilized widely. However, this method does not suppress the helminthosporiosis infection. Moreover, after being sown in the soil the seeds are not protected against soil pathogens. For this reason it is essential to coordinate thermal disinfection and the chemical treatment of the seeds with TMTD (1.0-1.5 kilograms per ton). As a production examination in the elite-seed farming Vol'no-Chernikhovo Farm of Baranovichskiy Rayon conducted in 1978 showed, this enabled farmers to produce an additional 3 quintals per hectare of barley. The phyto-examination of seeds and the subsequent disinfection allow farmers to increase their class and to guarantee a high rate of field germination. We feel that in the near future zonal control-seed laboratories will have to conduct phyto-examinations of seeds locally. By the end of the five-year plan scientists should have developed and recommended dependable measures for fighting snow mold, root rot, intra-stalk and suctorial pests and resistant weeds.

In potato farming problems have arisen in protecting crops from pests and diseases as well. On each farm it is essential to introduce a technology that will provide a yield of 250-300 quintals per hectare with a minimal expenditure of labor and resources.

The Colorado potato beetle and the late potato blight do the most damage to potatoes. However, with a good and timely organization of a protection system it is possible to bring the degree of harmfulness to a minimum. In recent years there has also been an increase in the incidence and harmfulness of viral and bacterial diseases. Thus, 3-5 percent and more of potatoes are infected with wire stem. The workers of virological laboratories of BelNIIZR in various soil-climactic zones of the republic have established that potatoes become infected with several viral species of the mosaic group (X, S, M, Y, A, leaf curl, pogremkovost' [Translation unknown]). Dangerous diseases such as the mosaic curling of leaves, rugose and striped mosaic decrease the potato yield of late varieties by 33-72 percent, and of early varieties by 5-30 percent. In the institute recommendations have been worked out on cultivating potatoes on a non-viral basis. (A. L. Ambrosov and others). These are being broadly applied in the republic in elite seed farms of scientific-production associations of potato cultivation. As a result these elite seed farms produce potatoes that are relatively free of viruses. In order to improve the phytosanitary qualities of elite seeds much still remains to be done to improve the methods of diagnosing viral diseases and the methods of fighting them. The treatment of tubers prior to planting can be of great prophylactic significance within the system of seed farming. A production examination conducted in 1978 at the Experimental Base imeni Suvorov, Uzdenskiy Rayon, showed that the disinfection of tubers achieves an increase in yield of 38 quintals per hectare, decreases the infection of the new harvest by scabs by eight times and by brown patch--by half (V. I. Kurilov).

In order to increase the effectiveness of the fight against late blight of potatoes it is essential to direct our efforts at the search and development of a technology for utilizing systemic fungicides with long-term protective action. This will permit us to raise the effectiveness of the fight during various weather conditions and to curtail the number of treatments.

Flax is one of the crops which decreases in yield when cultivated constantly or at frequent intervals in the same place. In such cases the problem of soil "flax fatigue" sets in. An important reason for this is the accumulation of phytopathogens. V. K. Neofitova has determined that after two cultivations of flax the infection potential of fusarial wilt of flax increases from 2 to 23 percent, and after three cultivations--to 32 percent. For this reason in connection with more thorough specialization and increased concentration in flax farming it is especially important to protect flax from diseases, to make the proper selection of predecessors and to introduce disease-resistant varieties because in crop rotations that are saturated with flax there is an accumulation of the agents of fusarial wilt, anthracnose, bacteriosis as well as of the products of vital activity of microorganisms, which are toxic for cultivated crops.

Under conditions of a high infection load, the creation of induced resistance is very promising. It is essential to develop a technology for its use with flax. Serious attention should be given to the development of effective measures to combat pasmo. The protection of crops from weeds has almost been solved. Nevertheless, it is essential to look at the timeliness and quality of operations in this area.

In beet farming the key problems remains the fight against weeds because the supplies of herbicides for sugar beets being cultivated for factory purposes does not exceed 30-50 percent. The institute's specialists have approved some new herbicides--betanal, geksilur, dalur, lenatskil and others--for weeding sugar beet crops. They will be introduced into production according to the order in which they were approved. Taking the acute herbicide deficit into account, it is also important to direct research at finding ways to decrease the expenditure rate of preparations, at selecting effective mixtures and synergids that raise their effectiveness.

In recent years the main directions for the development of commodity horticulture have been determined--concentration in specialized enterprises, intensification and acceleration of the transition of fruit and berry production to an industrial basis, the inclusion of commercial treatment, storage, processing and delivery of fruits and berries in one technological cycle, and the development of inter-enterprise ties. In the near future in Belorussia it is planned to create large inter-kolkhoz orchards of the industrial type using short seedlings and highly intensive varieties with a planned yield of 300-600 quintals per hectare. The production of such harvests will be related to the intensification of protective measures. In orchards of the new type, where the density of the tree stand is 600-2,000 per hectare a unique microclimate and the corresponding ecological environment are created, encouraging the development of diseases. For this reason, in evaluating the suitability of a variety, resistance to fungus diseases will be very important. There will be an increase in the harmfulness and possible losses of harvests due to scab, moniesiosis, bacteriosis, powdery mildew and especially due to their leaf forms. The apple worm, leaf miner and suctorial will become serious problems. It is essential to strengthen work on the study of specific aspects for protecting plants in intensive-type orchards.

The intensification and concentration of vegetable farming are resulting in the mass development and accumulation in the soil and in plants of harmful entomofauna and phytopathogens. In addition to incurring losses of gross yield, the pests and diseases significantly decrease the quality of production. In connection with this the protection of vegetable crops must be adapted to their cultivation on an industrial basis. These products are used in raw form, and for this reason it is important to keep the crops free of residual pesticides. In connection with this it would be more effective to utilize biological methods. This is particularly true for enclosed ground farming. Of course we know that in the near future the biological method will not be able to provide dependable protection of all crops and that chemical methods will be extensively used. In connection with this it is

essential to secure the maximal safety of pesticides for agricultural crops, man and the environment. Dependable technological controls are also required for the efficient and safe use of preparations.

In our opinion the continued intensification of agricultural production with the simultaneous protection of crops presupposes not only a growth in the volume of use of agrotechnical, biological and chemical means but also the development of an organization and technology of farming which will secure the optimal phyto-sanitary crop condition. It is the duty of the protectors of plants to utilize all reserves in order to produce and protect large and stable harvests.

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PRIVATE PLOTS: THE BATTLE AGAINST PLANT DISEASE

Moscow ZASHCHITA RASTENIY in Russian No 8, Aug 79 pp 22-23

[Unsigned article: "An Important Source of Additional Products"]

[Text] In our nation the output of agricultural products is growing yearly. This growth is above all due to concern about strengthening the economies of kolkhozes and sovkhozes. However, even under conditions of highly developed socialist agriculture, a sizable share of certain products consumed by the population, above all fruits, produce, berries, potatoes, meat, milk, and eggs are still produced by the private subsidiary operations of kolkhoz workers, other workers and employees.

The decisions of the 25th CPSU Congress and the July and November (1978) plena of the CPSU Central Committee outline measures for further developing and supporting this form of production. Article 13 of the new Constitution of the USSR directly states: "Plots of land allotted by established legal procedure can be used by citizens to conduct subsidiary operations (including raising livestock and poultry), gardening, and orchards, as well as for individual residential construction. Citizens are obligated to rationally utilize the land given them. The state and kolkhozes are to render assistance to citizens in conducting subsidiary operations."

It is brought to attention that the development of private forms of production (together with social) not only solves the problem of supplying food, but also permits more completely utilizing the nation's labor resources, and provides the urban population with the possibility of healthy, active relaxation and communication with nature.

The first results of these measures are already visible. These include the increasing material for private operations, organizational assistance, and the change in the moral climate concerning the work of people on their own plots. The increased production of fruit, produce, potatoes, meat, etc. on subsidiary operations

apart from basic work time is acknowledged as being as honorable as any other type of work. It is no accident, for example, that in the Russian Federation alone more than 15 million families have private plots and 2.5 million people are members of gardening associations. They have more than 3 million hectares of agricultural land at their disposal. These figures are now rapidly growing, and ever greater amounts of land which, for various reasons, cannot be utilized by public production are being allocated for use by the population.

However, allocating the land is only part of the matter. It is important to help members of gardening associations to utilize the land as productively as possible, and to obtain more plant and animal products. Local organs of power, kolkhozes and sovkhozes and trade union organizations are now intensifying and diversifying forms of this assistance. This also involves the allocation of fodder, material-technical supplies, construction materials, all possible kinds of consultation, and centralized implementation of certain types of work on plots of kolkhoz farmers, other workers and employees. For example, agrochemical treatment of private plots is now being conducted for a set fee. Owners of these plots can send soil samples for analysis at the nearest laboratory and obtain a scientifically based recommendation as to how much and what kinds of fertilizer are necessary for increased soil fertility.

Increased attention is being paid to subsidiary operations of kolkhoz farmers, workers and employees and to servicing such work. After all the functions of state inspectorates (and this includes all station chiefs), according to statute, include concern about plant health in the agriculture of all zones, independent of their departmental subordination. State inspectorates are responsible for conducting obligatory preventive protective measures, promptly liquidating foci of predators, diseases, and weeds, observing established quarantine rules, and implementing regulations on pesticide application. They have the right to observe any sort of land use, including private, and to demand that the plot owner strictly comply to obligatory recommendations.

Thus, the concern of state plant protection services about the conditions of plant health on private plots and collective gardens and orchards is not only directed towards maintaining yields from such operations but also to see that these plots do not become sources of dangerous predators, diseases, and weeds on kolkhoz and sovkhoz fields and orchards.

Many oblast and rayon stations have established close contact with garden and orchard associations and branches of societies for the protection of nature. They assist them with advice,

give lectures, and interviews with nature lovers, organize consultations, using plant and insect collections and reference materials. Laboratories and points for diagnosis and predictions systematically inform the population about the appearance of dangerous enemies of the harvest, about the schedules of and measures in the struggle against them using local newspapers, radio, and television. For example, the collective at the Belgorod Stazra [Plant protection station] has made the rendering of assistance to owners of private subsidiary plots a special section in conditions of competition. Some oblast straza, and stations for protecting green belts are also giving practical assistance to amateurs in the chemical treatment of plants. In order to do this they have organized mechanized detachments, points for renting equipment, and are supplying pesticides. Kolkhozes and sovkhozes are giving great assistance to owners of private plots in the struggle against predators, plant diseases, and weeds.

The articles published below explain the experiences in organizing this work in Alma-Atinskaya, Moscow, Donetskaya, and Chernigovskaya oblasts. The editorial board feels that this important discussion on ways of intensifying assistance to amateur, and owners of subsidiary plots given by state plant protection services, kolkhozes and sovkhozes will continue on the pages of the journal. It awaits letters and suggestions about strengthening this help from gardeners and orchard growers themselves.

It appears that there are considerable reserves here. It is no secret that there are still stations and quarantine inspectorates which shun interaction with the owners of private plots, with nature lovers, and are not interested in how to organize trade in equipment and pesticides in their regions. In addition they ignore alarming signals about the appearance of dangerous foci of predators and weeds which not only threaten neighboring private plots but also public crops and orchards. This is a clear case of managers and specialists at stations not fulfilling their immediate duties! Local boards of some gardening associations also deserve criticism. Relying completely upon outside aid, they do not conduct work to organize consultations and surveys, and are not concerned about dissemination of recommendations and information from plant protection stations.

Gardening collectives in a number of oblasts in the Ukraine are acting properly. They have invited specialists (usually pensioners) who will conduct liaison with plant protection stations, scientific institutions, carry out surveys and give consultations. The experience of progressive farms also deserves dissemination. They are using equipment from mechanized detachments to till private plots.

Unfortunately, detachments from Goskomsel'khoztekhnika Production Association are still not assisting owners of private plots.

Biological protective measures are very insufficiently utilized on private plots. Why not impose upon the nation's numerous biological laboratories the obligation of supplying Trichogramma, and where necessary phytocellulose and other bioagents, not only to farms, but also to the public? Now, when dozens of high capacity biofactories have already been built, this is completely possible!

The editorial board has received many letters from gardeners, produce raisers and flower lovers about breakdowns in the supply of pesticides to the public. It is especially intolerable that even those items which are produced by industry in sufficient quantities are not for sale. Major demands should be made upon the quality of pesticide packing, its marking, and the clarity and precision of the instructions.

Readers, especially pensioners, write also that they have long been vainly seeking in stores convenient and simple sprayers driven by electric motors or gasoline engines, models of which they have seen at exhibitions and in journals. In some oblasts it has even become a problem to buy backpack sprayers and spare parts.

The lack of scientifically based recommendations also hinders the organization of plant protection work on subsidiary and other individual plots. A few years ago it was noted in the journal that scientific institutions do not give consideration to the specific nature of such operations on small plots, their diverse crops and techniques, monocultures, and proximity to residential areas. It is sufficient to become acquainted with the numerous consultations in magazines and newspapers, and with lectures of specialists in order to be convinced that recommendations given to the public are, as a rule, based upon research conducted under kolkhoz and sovkhoz conditions. They do not give consideration to the necessity for a special approach to the methods and techniques of the struggle to maintain yields on garden and orchard plots, nor to the potentials and levels of owners' knowledge. A number of recommendations, especially those concerning the use of insecticides, have not been checked for many years and are simply passed on from one written source to another. Incidentally, even the very safety of such so-called "safe" materials used in the struggle against insects gives cause for doubt.

There are many problems, but the productivity of private plots depends to a considerable degree upon their successful solution.

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FORECASTS IMPROVE PLANT PROTECTION OPERATIONS

Moscow ZASHCHITA RASTENIY in Russian No 8, Aug 79 pp 46-48

[Article by I. Ya. Polyakov, chief, forecasting department, VIZR, A. F. Chenkin, director, TsNILP: "The Efficiency of Forecasts"]

[Text] The harvest's fate depends to a great extent upon timely and well organized plant protection. Such protection is most efficient when it has a preventive nature. Rational planning and efficiently conducted preventive work in plant protection an accurate determination of the size of the area subject to treatment, the prediction of economic advisability of measures are all impossible without a scientifically based forecast of events, and of the spread and development of dangerous organisms.

In our nation republic scientific research institutes for plant protection, and sector and specialized agricultural institutes under the leadership of VIZR [All Union Institute for Plant Protection] and TsNILP [Central Scientific Institute for Fruits and Vegetables] are engaged in making forecasts and determining the amount of work conducted in the struggle against plant predators and diseases. This work is based upon materials on the spread of plant predators and diseases obtained from stations and diagnostic and forecast laboratories. Thirty scientific institutes, 161 republic, oblast, and kray laboratories, and 1,088 diagnostic and forecast points participate in making forecasts.

Forecast reliability depends to a great extent upon the accuracy of initial information characterizing the state of the harmful species population and the ecological situation. According to our studies, the area of agricultural land per forecaster specialist is extremely large. For the nation as a whole is is 84,600 hectares, for the RSFSR - abour 90,000, the Ukrainian SSR - 179, the Kazakh SSR - 192, and the Uzbek SSR - 15,800 hectares.

These are considerably higher than in other CEMA nations. Therefore, further improvements in forecasting accuracy might be obtained primarily through utilizing automated methods of collecting initial information and computer assisted data processing. In such a case we can expect that forecast accuracy would reach 85 percent.

The information arriving from the operational network about the state of the predator population and plant diseases, as well as about specific environmental factors influencing their development should accurately correspond, with regard to its content, volume, date of processing and transmission to institutes developing forecasts, to the methodological instructions ratified by the USSR Ministry of Agriculture. The forecast departments of VIZR and TsNILP have developed a program for systemizing software of forecasts and for the further improvement of the appropriate methodologies. It is necessary to intensify research directed at the improvement of logical and mathematical forecast models based on the newest ideas about population dynamics, upon the foundations and solutions of technological problems in the use of automated and remote methods of gathering initial information, processing it, and making decisions.

In our nation we now compile forecasts on the spread of about 250 of the most dangerous predators and diseases of the main agricultural crops. These include: four species of marmots, eight species of field mice (*Microtus*) and mice, grasshoppers, boll worms, winter moths (*Agrotis segetum*), cabbage cutworms, grey grain cutworms, and others, eurygaster, carabids, corn borers, rust diseases of wheat, root rots of grain crops, late blight of potatoes, beet pests (*Cleonus=Bothynoderes punctiventris*), and flea beetles (*Chaetocnema brevinscula* Fal.). aphids, mites and ticks, Colorado beetles, beet webworm (*Loxosteg sticticalis*), snapping beetles (*Elaterieae*), a complex of predators and diseases of cotton, fruit orchards, produce, melons, and other crops.

Scales of pesticide use have reached such a level that it is necessary to precisely plan the magnitude of the struggle against predators and diseases over a multiyear period, annually, and seasonally.

The implementation of protective measures is based on the appropriate scientific, methodological, material-technical, personnel, and organizational support. On a nationwide level all this work is planned and conducted upon the basis of multiyear forecasts of the probable level of the economic significance of harmful organisms, giving consideration to long ranges in agricultural production technology and its influence on the formation of harmful flora and fauna. Another equally important function of forecasts is ensuring

the timely implementation of plant protection methods. The forms of the compilation and utilization of plant protection forecasts are as diverse as the tasks.

Multiyear forecasts are developed by scientific institutions and serve as the basis for state policy in planning research, the production of plant protection materials and machinery, the training of cadre, and improvements in the organization of plant protection services. The efficiency of these forecasts depends upon how completely they give consideration to and implement the types and amounts of outlays in planning scientific research, the production of materials and equipment, and training cadre.

Based on multiyear forecasts developed by VIZR, calculations are made of the requirements for plant protection materials, cadre, and a scientific problem framework is developed for the five year plan. The orientation forecast developed by VIZR up to the end of the 20th Century is the basis for decision making to support the development of plant protection which will meet the requirements of agricultural production.

Annual forecasts are jointly developed by scientific institutions and plant protection services. They are the basis for planning protection work and have a preventive direction. Planning is not only based upon forecast information about expected levels of development of harmful species in individual regions, but also upon previously developed norms giving consideration to economic advisability and the most rational contemporary technology for applying plant protective materials.

Annual forecasts orient production organizations with regards to the possible volume of plant protection operations, and to the use of preventive agrotechnical and organizational measures. Within a specific ecological situation such measures can reduce the size of harmful species' population and reduce the volume of pesticide use. Thus, annual forecasts are, on the one hand, based upon the volume of protective operations, and on the other, point to ways of reducing such operations through the implementation of preventive agrotechnical and organizational-economic measures.

The final volume of protective applications is established on the basis of corrected seasonal forecasts giving consideration to the efficiency of using various types of agrotechnical methods and to the ecological situation to reduce the danger of various species.

In some cases short term forecasts are made. These determine the advisability of specific preventive or protective measures against species exhibiting especially dynamic development.

The importance of such forecasts is obvious. However, in spite of this it is very difficult to estimate their economic efficiency. One of the reasons for this is that they are directed towards the solution of three tasks: the determination of the expected level, the spread and development of harmful species and the recommendation of a complex of measures directed towards preventing harvest losses within the existing situation; the determination of orienting volumes of treatment (chemical, biological); the recommendation of measures directed towards reducing the amount of protective measures through the utilization of preventive agrotechnical and other methods.

In the latter case, especially when it concerns dynamic forms, it is necessary to overcome a certain psychological attitude of production organizations. Thus, in spite of a definite fall in the population levels of eurygaster as a result of changing ecological conditions in 1968 and the following three-four years, the demand of production organizations and draft plans for treatment were about twice as high as necessary. Even now there is sometimes disbelief about the forecast of a drop in the predator population and therefore the treatment volume planned by the operational service are still about 20-25 percent higher than necessary. The operational service also reacted with disbelief to the forecast of an increase in the population of beet webworms in 1968, and the treatment volumes in 1970, 1974, and 1975 turned out to be lower than necessary. Later, after the outbreak and mass spread of the predator in 1975 production organizations' demands were two-three fold higher than advisable norms.

Domestic and foreign experience indicates that by using annual (seasonal) and short term forecasts plant protection expenditures can be reduced by at least 25-30 percent. For example, in 1977 with a total national planned volume of such work of around 1.49 billion rubles, savings amounted to 370-450 million rubles.

There is still another important aspect of forecasters' work - sending warnings on the deadlines and sites of implementation of protective operations. This is conducted by state and intra-farm plant protection services using the methodologies developed by scientific institutions.

This work has two stages: In the first the state plant protection service determines the times during which it is most advisable to conduct protective operations, and the intrafarm service determines which crops and stands should be treated. As a result timely treatment in the necessary amounts is ensured. Proper warnings increase the efficiency of protective measures by at least 10-15 percent, and consequently reduce costs by an equal amount and increase the income obtained. At the same time treatment conducted at improper dates can not only lack effectiveness, but can even be harmful. The more precise specification of the treatment volume by excluding

fields which are only slightly infested with the predator (below the economic threshold) reduces such volume by approximately one third, and reduces pesticide consumption by roughly the same amount. Costs of the struggle against dangerous organisms are reduced and income from protective operations increased.

The Tadzhik SSR is an example of the results from a smoothly operating warning system when consideration is given not only to the times at which harmful organisms appear, but also to their population on each field and to the determination of treatment advisability. Up through 1963 the republic underestimated the role of a warning system and paid no attention to the danger threshold. This led to increases in the volume of chemical applications. As a result, in 1963 the average number of treatments reached 10. However, their effectiveness was unsatisfactory. After a critical reevaluation of the approach towards plant protection, in which specialists from VIZR participated, and after the creation of a survey and observation network on the farms (1964), the treatment volume began to gradually decline. For example, the application of pesticides per hectare was reduced from 52 kilograms to 8 in 1974. In 1975 the area of applications against bollworm (*Heliothis armiger*) was reduced by 373,000 hectares compared to the preceding year, and against spotted mite the figure was 385,000 hectares. Total savings of direct costs for protection from these pests amounted to two million rubles annually.

In the struggle against grey corn borer a warning system about the times at which young larvae appeared, a population count, and warnings on the danger threshold on wheat fields made it necessary to treat only 20 percent of the infected fields even in years of mass insect population growth. A count of the number of eurygaster which had survived the winter and a determination of the advisability of protective measures made it possible to reduce annual applications against them by 500,000 hectares.

These examples vividly indicate the great significance of warning in plant protection. Its further improvement opens extensive prospects for increasing the efficiency and reducing the costs of protective measures.

Through the use of forecasts the nation as a whole has succeeded in reducing direct costs in the struggle against harmful organisms by almost 450 million rubles annually. Simultaneously, the efficiency of protective has increased by 15 percent. As the total value of additional crops obtained in the USSR through protective is around seven billion rubles, this amounts to about one billion rubles annually. Costs for supporting specialists participating in the collection of initial information, processing it, and making forecasts and warnings amount to about six million rubles annually. Consequently the rate of return on these expenditures is about 150 fold.

In face of the growing intensification of agricultural production and the increased significance of plant protection in maintaining yields, there is also an increase in expenditures for the struggle against harmful insects and diseases. According to I. Ya. Polyakov's data (1972, 1976), in the developed nations the growth rates of costs for plant protection measures are four-five times higher than agricultural production and amount to 5-10 percent of the prime cost of all plant products. In Hungary during 1975-1977 average costs for plant protection amounted to 15-18 percent of agricultural output prime costs, and in fruit raising they reached 40 percent (information from services for plant protection and agrochemistry presented at a symposium in Budapest in 1977). Therefore, a calculation of the influence of warnings and forecast on protective measure efficiency and expenditure pay offs is very important in ensuring the overall profitability of plant protection. This also directly applies to the use of forecasts for the rational planning of plant protection work.

We conducted an analysis of protective measure economic efficiency during 1975-1977. For the nation in general the profitability of such measures amounted to 348 percent in 1975, 304 percent in 1976, and 432 percent in 1977. The most efficient, and consequently the most rapid pay off rates were measures for potatoes (from 580 to 888 percent), produce and melons (576-818 percent) and orchards (428-765 percent), and in some years, for vineyards, cotton, flax, hemp, tobacco, and makhorka (*Nicotiana rustica*).

In 1977 the struggle against beet webworm and southern grey boll weevil on sugar beets was unprofitable.

The influence of the degree of accuracy with which recommendations made by forecasters were observed, as well as the reliability of the forecasts themselves, was evaluated. One should note that only in our nation are the forecasts for the coming year and season in the form of recommendations for specific amounts of protective treatment. In other nations there are only indications of the overall tendencies in changes in the spread of harmful species. Correspondingly, we judge forecast accuracy by the degree to which the extent of protective measures and the recommended ones are in accordance with forecasts. However, some circumstances directly influencing the treatment volume and efficiency are not always taken into consideration. Recommendations on the amount of treatment are made with the assumption that they will be conducted within the optimal times and in accordance with the accepted threshold of economic advisability of such treatments and with complete observation of recommended processes guaranteeing a specific technical efficiency and thoroughness. As analysis has shown in all cases of increased amounts of treatment the incomplete implementation of these requirements has been noted.

Such shortcomings are usually explained by the insufficient availability of the necessary plant protection materials and machinery for their application at farms, or are due to unfavorable weather conditions during the times treatment should be conducted.

Our comparison of plant protection expenditure profitability and the correspondence between the amount of plant protection recommended by the forecast and that actually conducted reflects forecasting accuracy to some degree. The comparison of work volume recommended by the forecast with that actually conducted has indicated that in general the accuracy of the forecasts is sufficiently high and for the nation as a whole is over 70 percent. For example, in 1975 the forecast called for treating 28 percent more crop area than was actually treated, in 1976 the figure was 26 percent more and in 1977 - 21 percent less. When one examines the reliability of forecasts on the recommended protective operations for individual agricultural crops, one finds a high degree of accuracy, approaching 100 percent for the treatment of sugar beets, cotton, flax and hemp, potatoes, produce, melon crops, and grapes. This is due primarily to the integrated nature of measures on such crops.

During this same period the amount of treatment on the following crops differed considerably from that recommended: two species of cutworm, web beetworm and stubble moth, mouselike rodents, predators and diseases of fruit orchards and of other crops. This is due to the fact that in some cases insufficient consideration is given to the degree of favorability of conditions for the mass spreading of harmful species, although the overall tendencies for expected development were correctly predicted. For example, during 1975, 12.3 million hectares were treated for web beetworm using all available, and frequently inefficient methods, since according to the forecast compiled in 1974 the minimal variant called for only protecting 1.5 million with chemicals, and the one adjusted at the beginning of May called for treating 8 million hectares. In practice, the threshold of economic advisability of treatments was reduced by three fold compared to the generally recommended ones for this predator.

Subsequently, in 1976, 1977, and 1978, there were changes in the system of forecasting the spread of web beetworm in which consideration was given to its specific biological characteristics. On the basis of the autumn condition of the population, the maximum possible treatment for the following year was determined. It was indicated here that depending upon the degree to which conditions were favorable for development of the first generation, it could be reduced by 75 percent. The extent and location of reductions in the recommended treatment area, depending upon weather conditions in the spring, were also determined. In addition, there were corrections in treatment magnitudes depending upon the ecological situation during the development of the second and third

generations. The corrected amounts of treatment were close to the actual ones (Table 1) in spite of the active striving on the part of production organizations to increase pesticide reserves for conducting such treatment.

Table 1

Year	Amount of treatment recommended by forecast (1,000 hectares)		Amount of treatment actually conducted
	Fall	Spring	
1975	1,500	8,000	12,286
1976	8,000	3,500	3,311
1977	7,000	5,000	4,060
1978	6,000	1,000	1,125

In short, an acceptable system of predicting the spread of organisms and planning effective treatments against web beetworms was found. However, protective measure profitability remained low. This is due to the relatively weak degree of damage caused by the leaf eating form. According to the most recent data, the threshold number at which it is advisable to treat should be increased by a factor of three.

In spite of the high profitability of protective measures in the struggle against a complex of predators and diseases of fruit and berry crops (428-765 percent) they are still not completely conducted and the recommended complex of protective measures is not conducted everywhere (Table 2). In addition, their quality is frequently low. As a result kolkhozes and sovkhozes loose sizable amounts of the harvest and suffer losses due to the low quality of the products obtained.

Table 2

Year	Amount of treatment according to forecast (1,000 hectares)	Amount of treatment actually conducted
1975	10,000	5,850
1976	20,000	8,554
1977	20,300	8,285
1978	20,300	6,703

For example, as a result of failure to conduct planned measures on orchards, kolkhozes and sovkhozes in the Uzbek SSR annually loose fruits valued at tens of millions of rubles. In 1978 the struggle against harmful organisms was conducted on only 137,000

hectares out of 150,000 of fruit orchards. Only one treatment was applied, although in the Uzbek SSR apple worm (*Carpocapsa pomonella*) produces three generations, and, as a minimum requires 10 treatments. Only in this way is it possible to completely protect orchards from predators and diseases. On some farms harvest losses exceed 80 percent.

In the struggle against mouselike animals (Muridae) the recommended processes are not completely observed and there are delays in the beginning of protective treatment. These lead to sizable increases in the amount of treatment compared to that recommended. Naturally, this has caused a reduction in operation profitability. Table 3 shows the differences in the forecasted and completed amounts of treatment for the last four years. One should note that increased amounts of treatment not only raise prime costs, but also reduce efficiency.

Table 3

Year	Forecasted amount of treatment (1,000 hectares)	Amount of treatment actually conducted
1975	4,500	9,054
1976	3,000	4,386
1977	4,500	6,545
1978	8,000	11,150

These materials indicate that an accurate prediction substantially influences the proper planning of measures for plant protection, the degree of their preventive nature, overall efficiency and profitability. Therefore measures are now being taken to improve the logical and mathematical models of forecasts, the automation of the collection and processing of the necessary information.

Special attention should be directed towards the timeliness, accuracy, and completeness of the use of forecasts and the preventive measures recommended on their basis during the planning and organization of plant protection operations.

As agricultural production is further intensified there is an increase in the role played by forecasts for various time periods in order to optimize plant health conditions of agricultural crops.

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ROSTOVSKAYA OBLAST FALLOW LAND REQUIREMENTS STRESSED

Moscow PRAVDA in Russian 11 Aug 79 p 1

[Article by M. Kryukov (Rostovskaya Oblast): "An Ear Ripens in the Autumn"]

[Text] The harvest work is nearing completion in the Don River region. The grain harvesting operations are being carried out by more than 1,200 harvesting-transport complexes and detachments, including roughly 20,000 grain combines and more than 15,000 harvesters. In striving to harvest all of the crops grown, the farmers are at the time establishing a strong foundation for the future harvest.

I had occasion to visit the Kolkhoz imeni Litunov at the peak of the harvest season. Accompanied by the secretary of the party committee, P. Tsybul'nikov, I drove out to the edge of a 100 hectare tract of land. Twelve "Kolos" combines were scurrying over this land in the manner of giant canoes. The farms include more than 10,500 hectares of arable land. More than one half of this amount is occupied by grain crops. And although the year has turned out to be a difficult one, an average of 30 quintals of grain has been obtained.

"The bare fallow furnished 40-45 quintals" stated the chief agronomist for the kolkhoz, A. Bogdanov, "Without the bare fallow, it would have been impossible to obtain such a high yield per hectare."

This year the farmers were forced into taking a second look at many of their agrotechnical methods. For example, the farm leaders and specialists are becoming more and more convinced regarding the need for increasing their fallow land areas.

In the detachment headed by the well known Don region grain grower and Hero of Socialist Labor, Fedor Kanivets, the average yield was 32 quintals per hectare. However, the fallow fields yielded more than 42 quintals.

"The farms in Zernogradskiy Rayon" stated the head of a department at the Don Breeding Center, I. Kalinenko, "left no less than one "clean" field, or

10-11 percent of the arable land, in each crop rotation plan. During the past 10 years, the cropping power has increased by 16 quintals. Even this year, despite the drought conditions, the rayon's workers obtained an average of 27 quintals of grain and from 100,000 hectares -- 30.6 quintals of winter wheat per hectare. The grain production level per hectare is considerably higher than that for the neighboring Yegorlykskiy, Tselinskiy and Azovskiy rayons, where there is roughly only one third as much fallow land.

In other words, it is difficult to proceed in the absence of fallow in the Don River region. Such is the opinion held by the scientists and practical workers. But why is the crop rotation plan being violated? The situation is such that unoccupied arable land is considered to be fallow on some farms and thus an attempt is made to "pack" to the limit each hectare with plantings. Although the intent here is noble in nature, the desired results are not always obtained.

At the present time, with the foundation for the future harvest being established in all areas, the agricultural organs and scientists must take into account the experience of the current year and display concern for ensuring more rational utilization of the arable land and observance of the crop rotation plans.

Greater importance is being attached to the winter fields. This year they will be increased in size in the Don River region. The Rostovskaya Oblast Party Committee and the oblast executive committee adopted a resolution on the carrying out of the autumn sowing work. Special attention was given in this decision to the plowing schedules and quality in behalf of the winter crops and to the preparation of the bare fallow. The customary and "classic" soil cultivation method was replaced by a surface method. Disk-tillers and flat-cutting cultivators became the principal tools. The fields become more level and thus they retain and accumulate moisture to a better degree. Such tracts tend to ensure the development of healthy and uniform shoots. The Rassvet Kolkhoz was one of the first in Yegorlykskiy Rayon to complete the preparation of its soil for the winter crops. Grain crops were planted here on more than 2,000 hectares. The combines were followed immediately by tractors. The land was plowed by two detachments that were "reinforced" with teams for providing technical and domestic services. The work was carried out in shifts around-the-clock. Machine operators N. Panasyuk, I. Cheryachukin, I. Sanin and others fulfilled their shift norms by 150-160 percent.

The surface cultivation method for working the soil took root very well at the Mal'chevskiy Sovkhoz. For several years now the fields here have been worked using flat-cutting implements and the yields obtained have been higher than those obtained at neighboring farms. Unfortunately, this experience has by no means been adopted by all of the farms. Many have continued to cling to the old agrotechnical methods. There are farms in Zimovnikovskiy and Kasharskiy rayons where non-mouldboard cultivation of the

fields is not practiced. Here the arable land is lumpy in areas. A "classic" plow does not break it up very well and it is not possible for a flat-cutting implement to make a wide turn here. In a majority of rayons throughout the oblast, the plowing detachments are carrying out their work at a high tempo. Of 1.91 million hectares allocated for the winter crops, almost 1.8 million have already been prepared.

The day is not far off when the sowing units will make an appearance on the fields in the Don River region. The farmers are striving to prepare their soil for next year's harvest in a better manner and as rapidly as possible.

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WAYS TO IMPROVE THE VEGETABLE CANNING INDUSTRY

Minsk SEL'SKAYA GAZETA in Russian 28 Aug 79 p 2

[Article by Candidate of Economic Sciences Ye. Savitskiy, senior associate at the Belorussian Scientific Research Institute of Agricultural Economics: "Important, Pressing Problems"]

[Text] One feature of the 10th Five-Year Plan is the intensification of specialization in the area of agricultural production. Quite a bit has already been done in this important work sector, especially in stockraising. As concerns field-crop cultivation and vegetable growing, the result has thus far been poorer. And this is largely to be explained by imperfections in the system of procuring, processing and marketing fruit and vegetables. And this has led to a situation in which only three percent of the berries, 20 percent of the fruit and 70 percent of the vegetables is being purchased in the procurement zones of republic canning plants. The amount of vegetables and fruit being brought into the republic from other union republics remains quite high, which is clearly inexpedient and in no way justified.

One not insignificant factor delaying improvement in the concentration and level of production of vegetables is the imperfectly regulated mechanism of economic relations between farms and processing enterprises. The latter sometimes limit themselves to purchasing vegetables and fruit on the basis of forward contract agreements. Moreover, raw material generally arrives at the plants only when the fruit and vegetables are ripening fastest. As a result, the processing enterprises initially are overloaded and then operate intermittently, much raw material spoils at procurement centers and yards, and the state incurs losses. This also affects produce quality. The seasonal load on the plants and the shortage of manpower also dictate a poor assortment of vegetable canning enterprise output -- nearly all the apples must be juiced, and cucumbers and tomatoes are only canned in large cans.

So what should be undertaken to improve the state of affairs in this branch? First, it is time to set a definite amount of additional payments to kol-khozes and sovkhoz fruit and vegetable quality in agreements between farms and enterprises. If this were done, the plant would receive the needed

raw material and the additional expenses would be recompensed through the marketing of higher-quality output. Solution of this important problem will depend on the republic ministries of agriculture, food industry and procurement.

As is known, in order to process tomato products, especially high-quality juice, the fruit must contain at least five-percent dry substances. In this connection, it is necessary that all-union state standards be developed and approved for tomatoes for industrial processing. It would be appropriate to introduce an additional payment for a higher percentage of dry substances in tomatoes. And that is just what is being done in the Moldavian SSR, where the successes in developing this profitable branch are well-known. Our republic as well has some experience in accepting raw material with consideration of the content of certain substances in it. Thus, reciprocal calculations between farms and potato processing enterprises are made with consideration of starch content. And the material interest of the farms has made it possible to increase potato starch content for the republic as a whole, due to the concerned selection of the best varieties.

Much of the lack of coordination in interrelationships between processing industry enterprises, kolkhozes and sovkhozes could be resolved under agro-industrial integration, and in particular, the large gap between collection of the harvest and its processing, following technological requirements as to raw material and end product quality, and extending the vegetable processing season by sowing at different times. Convincing proof of this is "Brillevo" sovkhоз in Gomel'skiy Rayon, where these problems are being solved very successfully.

Development of the branch is also being retarded by the fact that the structure of siting agroindustrial enterprises which has evolved by no means fully corresponds to their production tasks. And that is to be explained by the fact that a majority of them are subordinated to different organizations: trusts, agricultural administrations. Moreover, such sovkhоз plants are subordinate to various trusts, each of which pursues its own advantage. As a result, seven of the agroindustrial enterprises also grow sugar beets along with grain and potatoes, 24 also grow flax, and 50 vegetables. Does this not delay concentration and specialization?

The interests of increasing the effectiveness of agroindustrial production demand that all plants processing potatoes be switched over to the "Belglavskotoprom" system, in which the potential of cooperation is used most effectively. This group of enterprises has the highest profit indicator per 100 hectares of farmland and per worker, as well as in meat production. In particular, the plants of this system provide 650,000 to 670,000 tons of slops each year, which corresponds to 330,000 quintals of fodder units in terms of feed value. But these indicators could be even better.

At present, the republic is finding it necessary to create agroindustrial associations using alcohol and starch plants already united organizationally with sovkhozes as a base and to run the production with the rights of

production subdivisions. However, the raw material requirements of a considerable portion of such plants cannot be met by the resources of a single farm. Therefore, processing enterprises will continue to structure their work in this particular type of agroindustrial association on the rights of production subdivisions. Under the new conditions, they will perform the exact same functions as processing enterprises which are independent in a production-financial regard. The kolkhozes and sovkhozes comprising the associations must provide the alcohol and starch plants with raw material, but they will supply the lead farm with young beef for final fattening, in order to make efficient use of processing scraps. Contra accounts for cattle supplied must be based on prices worked out by the Belorussian Scientific Research Institute of Agricultural Economics.

The advantageousness of this step is confirmed by calculations. First, whereas the alcohol plants currently purchase up to 40 percent of their raw material and the processing season lasts only 150-160 days, the season could be significantly lengthened in an association. The mistaken opinion that it is disadvantageous for farms to supply processing enterprises with potatoes would disappear. The fact that that is not so is indicated by the example of the farms supplying the "Rachkovich" alcohol plant in Slutskiy Rayon with potatoes.

If the average market price of a quintal of potatoes marketed for food purposes is compared with that of potatoes for industrial processing, marketing potatoes for food purposes appears considerably more profitable at first glance. However, if the total receipts from marketing early potatoes and above-plan and high-quality varieties are subtracted from the total, then the average market price is 6.42 rubles per quintal [whole] and 6.32 rubles per quintal processed. As we see, the difference is slight, the more so since it would be nonexistent were high-starch varieties to be introduced. Moreover, consideration must also be given to the fact that kolkhozes and sovkhozes sell up to 15 percent substandard potatoes, at lower prices, when marketing potatoes for food purposes. But at the alcohol plants, such potatoes are all processed and are consequently paid for at profitable prices.

With a view towards increasing the material interest of association farms in sending the harvest on for processing, it would be appropriate to distribute up to 20 percent of the profit from marketing alcohol produced from potatoes among the raw material supplier farms. The appropriateness of this step is to be explained by the fact that the lead enterprise would be compensated by receiving cheap feed in the form of raw material processing scraps.

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HOG RAISING SUCCESSES IN GOR'KOVSKAYA OBLAST

Moscow ZHIVOTNOVODSTVO in Russian No 8, Aug 79 pp 11-13

[Article by Candidate of Economic Sciences Yu. I. Ugarov, director of the sovkhoz-combine imeni 50th anniversary of the USSR, Gor'kovskaya Oblast: "Hog-Raising Output On Stream"]

[Text] The sovkhoz-combine imeni 50th anniversary of the USSR is a large enterprise specialized for raising and fattening hogs. The sovkhoz was born six years ago. We began building it in response to the 1971 CPSU Central Committee and USSR Council of Ministers Decree "On Producing Stockraising Output on an Industrial Basis."

Oblast party and soviet organs paid a great deal of attention to construction of the sovkhoz, and the Komsomol assumed sponsorship of the construction site, sending Komsomol and student construction detachments to the site. As a result, a complex capable of raising and fattening 108,000 hogs per year, a mixed feed plant and a housing development were put into operation within 30 months. In 1974, the complex had mastered all the planned indicators. The state was sold 12,600 tons of pork, the average daily weight gain was 637 grams, labor expenditures per quintal of increase were 2.3 man-hours and feed expenditures were 4.1 fodder-unit quintals, the prime cost per quintal of pork was 65 rubles.

In 1973, the sovkhoz-combine embarked on construction of a second complex of the same size; it was put into operation in late 1975. This complex is located 150 m from the first. The complex was built of interconnected units and consists of five buildings (the first complex, a pavilion type, consists of 19 buildings). Construction of the second complex at the same site saved a great deal of money. For example, the mixed feed plant located near the complexes meets all their mixed feed requirements without unnecessary transport outlays. The second complex cost the sovkhoz nearly two-fold less, inasmuch as it was not necessary to build housing, personal and cultural facilities, or utility lines. A significant savings was achieved in installing the utility lines, which were simply modified somewhat. The experience specialists and operators acquired in mastering the first complex played a large role in mastering the second. They became the tutors of the young collective at the second complex.

The sovkhoz is constantly seeking out ways of not just meeting, but also of overfulfilling established plan assignments. Thus, during the first three years of the 10th Five-Year Plan, the enterprise sold the state 65,970 tons of pork, with a plan of 58,800 tons.

A high level of mechanization of basic production processes and the intensive use of livestock has permitted a significant increase in the operator load and increased labor productivity. For example, artificial insemination operator G. P. Makarycheva achieved impregnation of 86 percent of 2,804 sows, ensuring the receipt of 19,800 sucklings; Ye. S. Baranova, an operator caring for suckling sows, has worked on the sovkhoz since 1973 and has obtained upward of 50,000 suckling pigs during that time, and in 1978 she serviced 120 suckling sows (instead of the normal 60) and raised 13,700 suckling pigs; in 1978 V. I. Treshina, an operator caring for sucklings from 27 to 106 days of age, obtained 584 tons of live-weight gain and sent 18,450 head on for fattening (given a norm of 4,200 animals); in one year, operator A. S. Rybachkova fattened 5,817 sucklings (given a norm of 1,800) and obtained a gross weight gain of 495 tons and an average daily weight gain of 654 grams.

In 1978 the sovkhoz sold the state 26,170 tons of pork, with a plan of 25,000 tons, and obtained 254,000 sucklings, or 47,000 more than in 1977. The average weight gain of hogs being fattened was 637 grams per day; expenditures per quintal of weight gain were 4.3 fodder-unit quintals and 2.6 man-hours. The sovkhoz obtained 9.6 young pigs per litter and 2.2 litters per sow for the year. The sovkhoz sold the population 9,800 suckling pigs to raise on private farms. The 1978 farm profit from sales was 28.7 million rubles. In six months of operation, the combine recompensed two-fold all expenditures on its construction, including on the mixed feed plant and the housing development.

The sovkhoz attaches great importance to organizing socialist competition. Each enterprise collective works out and takes on higher obligations at the start of the year. They are constantly in the center of attention in the collective. Work results are summed up each month at shop meetings, and the winners are given challenge red banners, pennants and testimonials at sovkhoz-wide meetings each quarter; material incentives are also used.

The sovkhoz-combine collective achieved high production work indicators in 1978. Output sales were 37,000 rubles per full-time worker; 203 kg of pork, worth 324 rubles, was produced per animal-place. Some 2,330 kg of weight gain was obtained per sow.

In response to the resolutions of the July and November (1978) CPSU Central Committee plenums, the sovkhoz collective assumed higher obligations anticipating an increase in sales of pork to the state of 450 tons more than the 1978 production level achieved. What are the reserves for increasing production? Last year, we sold hogs at an average live weight of 115 kg, but if we had succeeded in continuing the fattening for only seven more days, we could have obtained five kilograms more output per animal taken off fattening. Each day, the sovkhoz has 644 sucklings born and sells the packing

plants 600 hogs. There therefore is a precise calculation of animal movement and premises use. If the marketing of animals were delayed for just one day, the conveyor would stop, since there are no reserve premises. We decided, by mechanizing feed preparation and distribution, to build a summer fattening facility for 3,000 head, which will enable us to increase pork production this year by 450 tons. The sow herd at the combine is used basically for two years, that is, five litters are obtained per sow, and then they are slaughtered for meat. As six years of experience in operating the complex have shown, it is inexpedient to use sows for more than two years, since their productiveness drops. Consequently, each year 40 percent of the sows must be replaced. To this end, an experimental breeding farm has been built at the sovkhoz to produce 3,000 replacement sows each year. We became convinced while operating this farm that its capacity could be increased. The sovkhoz-combine technical council reviewed and approved a proposal by mechanical engineer A. I. Molodchuyev, farm chief B. M. Lesenkov and chief breeder L. V. Kaynov to renovate. Renovation expenditures were 200,000 rubles, and the farm capacity was increased 1.5-fold. The farm raises purebred large white pigs to 115-120 kg and sends them to the complexes. But the replacement pig requirements of the two complexes are still not being met. In order to meet them fully, the first complex created a breeding nucleus of the best sows. They are inseminated with sperm from large white boars. The 40 kg pigs obtained from them are raised in summer camps. All this has enabled us to avoid bringing in replacement stock from other farms.

The producer boars are kept at the sovkhoz-combine artificial insemination station, which supplies both complexes with semen.

The station crossbreeds large white sows with Landras boars. With cross-breeding, the fullest use is made of the species differences of the swine and of hybrid vigor. Hybrid vigor is manifested in increased fertility, in the size and faster maturation of the sucklings.

A sow impregnation level of 85 percent, 10 percent higher than the technological norm, was achieved thanks to the efficient use of producer boars, to good care and maintenance, and to active exercise.

To have a full technological process at the complexes, the RSFSR Ministry of Meat and Dairy Industry has begun building a packing plant, where swine will be slaughtered and finished products produced.

The problem of cleaning waste water at the complexes remains incompletely solved. In order to utilize and use the manure, we plan to have 2,000 ha of irrigated land on which vegetation will be grown to produce at least 6,000 tons of grass meal, which will meet the total annual requirement for it by both complexes and by the mixed feed plant. The sovkhoz has already begun reclamation work on 800 ha of swamp and has begun building a shop to prepare grass meal and facilities to store it. In 1978, we produced 1,740 tons of it on 425 ha. In order to reduce manure runoff, we used a water return system permitting a reduction in water consumption and waste discharge

to 1,500 cubic meters per day. We plan to irrigate fodder crops with the waste water in the growing season and to send discharges to a holding pond in the winter.

We must note the inadequate work being done by enterprises of the Goskomsel'khoztekhnika on material and technical supply to the sovkhoz-combine. Life has shown that it is appropriate for the USSR Ministry of Agriculture and the State Sel'khoztekhnika Committee to organize the centralized supply of complexes with the necessary equipment and materials in accordance with scientifically substantiated norms.

Double subordination also hampers the effective organization of material and technical supply to complexes. The sovkhoz is subordinate to the RSFSR Ministry of Agriculture's Svinoprom [All-Russian Production-Scientific Association for Hog Raising] and to the Gor'kovskaya Oblast agricultural production administration. But the assets, except for equipment, are in the oblast agricultural production association. In order to better organize material and technical supply, it is necessary, in our opinion, that assets be transferred to the Svinoprom, that is, that the problem be solved just as with the delineation of feed, monetary funds, and so forth.

It is also long since time that we solve the problem of providing complex workers with comfortable, good-looking, durable work clothes.

It should be noted that the sovkhoz mixed feed plant has been forced to produce feed without lysine, many vitamins, trace elements and other substances, since the RSFSR Ministry of Procurement has not ensured the delivery of these components to the plant. Thus, according to Gor'kiy agrochemical laboratory data, the mixed feed had 30 percent less crude protein, 33 percent less calcium and 90 percent less phosphorous in 1978. The mixed feed quality dropped especially sharply beginning in April 1978, after a branch standard was approved which anticipated high tolerances in the minimum and maximum amounts of mixed feed components, which made it practically impossible to monitor the composition of feed formulas. Moreover, mixed feed costs have tripled and their quality has not improved, which is reflected in the prime cost of hog weight gain (Table [page following]).

Continued reduction in prime cost is associated with ensuring the smooth supply of feed throughout the entire year in a firmly established assortment and quantity. It is also important to improve the existing wages of stockraising operators. It seems to us that introduction of bonuses to operators for saving on direct expenditures and to specialists for producing output above the established capacity would substantially facilitate reducing output prime cost.

Eliminating the shortcomings noted would facilitate even further increasing meat production.

The sovkhoz-combine collective is expanding work under the slogan of transforming 1979 into a year of shock labor, of selling the state 26,600 tons of pork this year and completing the 10th Five-Year Plan in 4.5 years.

Structure of Prime Cost per Quintal of Hog Weight Gain

	1974	1975	1976	1977	1978	1978 in % of 1974
prime cost per quintal of increment (rubles)	65.00	78.23	91.68	84.50	86.48	133
including mixed feed costs	41.22	51.31	59.21	56.92	69.22	167
other expenditures	23.78	26.92	32.47	27.58	27.26	114
proportion of mixed feed cost in total prime cost (percent)	63	65	64	67	80	

Work results for the first quarter of this year indicate that we have every opportunity for doing this.

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